

#### VECTOR CONTROL ACTIVITIES FOLLOWING **HURRICANE HUGO - 1989**

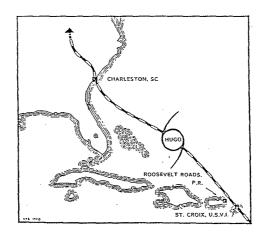


NEHC TECHNICAL REPORT

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CAPTAIN J.J. EDWARDS, MC, USN Commanding Officer

#### VECTOR CONTROL ACTIVITIES FOLLOWING HURRICANE HUGO - 1989



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#### NAVY ENVIRONMENTAL HEALTH CENTER 2510 WALMER AVENUE NORFOLK, VIRGINIA 23513-2617

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#### PREFACE

In September, 1989 Hurricane Hugo struck the Caribbean and the southeastern coast of the United States. This storm caused an unprecedented level of destruction and precipitated three separate requests to the Navy for vector control assistance.

The following technical publication is a compilation of reports made by members of the Navy's preventive medicine community detailing their actions in support of disaster relief operations following Hurricane Hugo. These pages reveal that the Navy Environmental Health Center and its echelon four commands have developed a strong and effective commitment to both the spirit and concept of the Mobile Medical Augmentation Readiness Team (MMART).

The success of our field operations in Puerto Rico, the U.S. Virgin Islands, and South Carolina as outlined by this report is the result of many long hours of planning, hard work, and training. Most importantly, this technical report represents the cumulative efforts and dedication of many individuals and truly gives meaning to the Navy Environmental Health Center's motto: Charlie Papa - "we are coming to your assistance". I applaud this success of our MMART teams and look forward to an exciting future as we work together to continue to improve our readiness and MMART capabilities.

#### DEPLOYMENT OVERVIEW

In mid-September 1989, Hurricane Hugo swept across the Caribbean. It its wake it completely devastated Naval Station (NAVSTA), Roosevelt Roads, Puerto Rico; the island of St. Croix, Virgin Islands; and Charleston, South Carolina. Extensive damage to infrastructure occurred at all three locations. Flooding and accumulation of large areas of standing water promoted the development of hordes of vector mosquitoes. The destruction of buildings and the disruption of regular waste management efforts promoted the development of large numbers of filth flies and potential rodent problems.

In response to these conditions, the Navy Environmental Health Center (NAVENVIRHLTHCEN), Norfolk, VA coordinated relief efforts of the Navy Disease Vector Ecology and Control Center (NAVDISVECTECOLCONCEN), Jacksonville, FL and the Navy Environmental and Preventive Medicine Unit No. 2 (NAVENPVNTMEDU TWO), Norfolk, VA. These Units provided personnel and equipment for an unprecedented, simultaneous deployment of three Vector Control Teams (VCTs) to separate geographic areas. Each team's mission was to provide technical and operational vector control assistance to the requesting authority until vector population levels had declined to pre-disaster levels and local public health efforts could be resumed.

Within hours of notification to deploy, equipment and personnel were staged and readied for transport. Compiling, inspecting, calibrating, packing, and arranging transportation and logistic support was an evolution requiring the participation of many military and civilian personnel. Working evenings and weekends, staff personnel enthusiastically fulfilled all requirements of a very hectic deployment schedule.

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# PREVENTIVE MEDICINE ASSESSMENTS

From: COMNAVAIRLANT Force Environmental Health Officer

To: Commander in Chief, U.S. Atlantic Fleet

Via: Commander Naval Air Force, U.S. Atlantic Fleet

Subj: PREVENTIVE MEDICINE ASSESSMENT OF NAVAL STATION ROOSEVELT ROADS, VIEQUES AND SAINT CROIX FOLLOWING HURRICANE HUGO

Ref: (a) PHONCON CAPT McCarty (CINCLANTFLT NO2M1)/CDR Perrault (COMNAVAIRLANT 0185) of 20 Sep 89

- (b) NAVHOSP ROOSEVELT ROADS RQ 202235Z SEP 89
- (c) NAVENVIRHLTHCEN NORFOLK VA 202300Z SEP 89
- (d) CINCLANTFLT NORFOLK VA 211854Z SEP 89
- (e) COMNAVACTSCARIB ROOSEVELT ROADS RQ 251230Z SEP 89
- Encl: (1) Preventive Medicine Assessment of Naval Station Roosevelt Roads, Viegues and Saint Croix
  - (2) Key Points of Contact During the Assessment
  - (3) Radio Brief Recorded at AFCN Roosevelt Roads on 24 Sep 89
- 1. In response to references (a) through (d), CDR John G. Perrault, COMMAVAIRLANT Force Environmental Health Officer, and LCDR Hugh R. Stevenson, an Entomologist from Navy Environmental and Preventive Medicine Unit No. 2, visited Naval Station Roosevelt Roads, Puerto Rico and Vieques naval facilities from 22 to 25 September 1989 to assess the potential for disease outbreaks and the need for preventive medicine assistance. At the direction of the Commander Naval Activities, Caribbean (COMNAVACTSCARIB), a similar assessment was conducted on 26 September 1989 of conditions on Saint Croix, U.S. Virgin Islands.

#### 2. Executive summary.

- a. Naval Station Roosevelt Roads. As reported in reference (e), the assessment found a very low potential for outbreaks of disease aboard Naval Station Roosevelt Roads. Despite extensive structural damage and loss of electric power throughout the station, the Naval Station and Naval Hospital ensured provision of minimal essential health related services including potable water, safe food, shelter, sewage disposal, trash disposal, garbage disposal, and health care. The Naval Hospital Occupational Health and Preventive Medicine Department had sufficient personnel to monitor these essential services, as well as disease vector populations. Although Public Works Pest Control personnel were conducting pest control operations to the extent of their capabilities, salt marsh mosquito and roof rat populations were unacceptably high. Accordingly, vector control assistance was requested in reference (e) to help control mosquitos and rodents aboard the Naval Station.
- f b. Vieques. While some problems with potable water distribution, human excreta disposal and food service were being experienced, the only outside preventive medicine assistance required was in controlling mosquitos at both the Naval Ammunition Facility and Camp Garcia.

#### c. Saint Croix.

- (1) Normal systems for potable water supplies, food distribution, sewage disposal, and trash and garbage disposal had broken down and many residents had lost their homes. At the time of our visit, food was being distributed and temporary shelter provided by the American Red Cross. Potable water was being distributed by the Navy and Army, but many residents were consuming unchlorinated water from cisterns filled by rain water. Human feces disposal was still a problem due to a lack of flushing water. Trash and garbage had not been collected since the hurricane and was piling up behind shelters, hospitals and homes, providing breeding sites for flies, and food for rats and wild dogs. Since dengue fever has occurred sporadically in the past and storm debris provides breeding sites for the mosquito that transmits dengue, there was a potential for an outbreak of this disease. Other mosquitos noted in high numbers at the airport are a significant nuisance, but are not a disease threat.
- (2) Based on our assessment, we advised the Commisioner of Health for the Virgin Islands and the Territorial Epidemiologist that in our opinion there was a significant potential for outbreaks of enteric diseases transmitted by water and food, and a lower potential for transmission of dengue fever. We also advised them of the availability of preventive medicine assistance from the Navy and recommended that they request a Navy Preventive Medicine Team to help monitor the sanitation of the Red Cross shelters, potable water supplies and waste disposal; provide laboratory testing of potable water and assist in vector surveillance and control.
- 3. A more detailed report of this assessment is presented in enclosures (1) and (2). The text of a radio brief given at the request of the Commanding Officer, Naval Hospital Roosevelt Roads on 24 September 1989 is presented in enclosure (3). COMMAVACTSCARIB and the Commanding Officer, U.S. Naval Hospital Roosevelt Roads were briefed daily on the progress of the assessment and our recommendations. Representatives from the Navy Environmental Health Center and Navy Environmental and Preventive Medicine Unit No. 2 were briefed on 28 September 1989. LCDR Stevenson also stopped enroute to brief Navy Disease Vector Ecology and Control Center, Jacksonville, FL.
- 4. Questions concerning this assessment should be directed to CDR J.G. Perrault, COMNAVAIRLANT Force Medical, Code 0185 at autovon 564-7028 or commercial (804) 444-7028, or to LCDR H.R. Stevenson, Navy Environmental and Preventive Medicine Unit No. 2 at autovon 564-7671 or commercial (804) 444-7671.

Very respectfully

J.G. PERRAULT CDR, MSC, USN

Copy to:
COMMAVACTSCARIB
NAVENVIRHLTHCEN NORFOLK VA
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NAVHOSP ROGSEVELT ROADS RO

### PREVENTIVE MEDICINE ASSESSMENT OF NAVAL STATION ROOSEVELT ROADS, VIEQUES AND SAINT CROIX FOLLOWING HURRICANE HUGO

- 1. Background. Hurricane Hugo struck Naval Station Roosevelt Roads, Puerto Rico on 17 and 18 September 1989 causing extensive structural damage and loss of power. The Fleet Surgeon requested that CDR John G. Perrault, MSC, USN, COMNAVAIRLANT Force Environmental Health Officer, visit Naval Station Roosevelt Roads to assess the potential for disease outbreaks and the need for preventive medicine assistance in the aftermath of the hurricane. Based on advice from the Navy Environmental Health Center, LCDR Hugh R. Stevenson, MSC, USN, an Entomologist from Navy Environmental and Preventive Medicine Unit No. 2, was assigned to assist in the assessment. The names and titles of key individuals contacted during the assessment are listed in enclosure (2).
- 2. Naval Station Roosevelt Roads. Conditions at the Naval Station were surveyed from 22-24 September 1989. To assess the potential for an outbreak of communicable disease on the Naval Station, the following factors were considered: protection and distribution of potable water and food; disposal of human excreta, garbage and trash; provision of shelter; diseases endemic in the area; presence or potential for breeding of disease vectors; adequacy of existing communicable disease, environmental health and disease vector surveillance; and the adequacy of disease vector and pest control. Sources of information concerning these factors included direct observation and discussions with key personnel listed in enclosure (2). The Naval Hospital's Environmental Health Officer accompaninied us throughout the assessment.

#### a. Findings.

- (1) Potable water. The Naval Station operates its own water treatment plant. Raw water is piped to the base reservoir from a protected mountain creek in El Yunque approximately ten miles from the base. This water is then treated by coagulation, flocculation, settling, filtration and chlorination. Water service was initially interupted during the storm by loss of normal electric power and difficulties with emergency power generation at the water plant. Water pressure was gradually restored over several days to all but the highest elevations in the Bundy area of the Naval Station as multiple distribution system leaks were repaired. Based on monitoring by the Naval Hospital, the potable water system was never contaminated. Free available chlorine residuals were raised to 2.0 ppm for the first two days after the storm and then lowered to 0.5 to 1.0 ppm.
- (2) Food service. Because of the loss of power throughout the base, food service operations ceased at all facilities except the General Mess (the Anchor Inn), the R&R Pizza and the Hospital Galley, each of which had emergency generators. Assessment of these facilities focused on bulk storage of fresh, frozen and semiperishable foods, time and temperature control during preparation and service, and personal hygiene of food service personnel with particular emphasis on hand washing.

- (a) Bulk fresh and frozen foods were stored at two warehouses. Frozen food was stored in 14 freezers at the Bundy Warehouse. Freezer temperatures ranged from 20-25 degrees F with no signs of food thaving. The generator had just failed at the time of our visit and was being repaired. Temperatures were reportedly lower before the generator went down. The cold storage warehouse (bldg. 53) had three freezers, two chill boxes and two dry store boxes. One freezer and one chill box were being unloaded and shut down at the time of our visit to reduce the load on the generator. Freezers were maintaining about 20 degrees F and chill boxes about 40 degrees. There were no signs of spoilage or thawing. Temperatures and generator operation were being closely monitored.
- (b) Canned semiperishable food was stored at the Dry Storage Warehouse (bldg. 60), an old wooden frame building. Much of the roofing material had been blown away in the storm leaving open holes in the roof. Double doors at both ends of the warehouse, which had been blown down by the storm, had been promptly repaired. Bats and rats were reportedly a chronic problem in the past. There was no evidence of recent rat activity in or around the building at the time of our visit, but bats were seen in the building. All semiperishable foods susceptible to contamination by rats or bats were stored in building 53 as a standard practice prior to the storm.
- (c) Food preparation at the R&R Pizza was limited to baking frozen pizza for immediate service. The Naval Hospital continued food service for patients and staff with little disruption. The Anchor Inn significantly expanded its operating hours and set up serving lines and seating under tenting outside the facility to accomodate a substantial increase in the number of patrons served. Freezers and chill boxes operated at proper temperatures and foods were kept chilled or hot on the serving lines. Holding times were kept short and there were no leftovers because of the large volume of patrons served. Adequate handwashing facilities were provided for food handlers. All meals were served using paper plates and caps, and plastic eating utensils.
- (3) Sewage disposal. Disposal of human excreta in the housing areas was reportedly a problem in the first few days following the storm because of the lack of water to flush toilets. On the day of our arrival (22 September) water pressure had been restored to housing and lack of flushing water was no longer a problem. The Naval Station operates three sewage treatment plants. All sewage treatment plants resumed operation after the storm. The Capehart Sewage Treatment Plant, which serves the main housing areas, experienced periodic loss of emergency power because of salt water contamination of the underground fuel tank. A small (about 50-75 gal.) above-ground fuel tank was being used, but reportedly ran out of fuel periodically before it could be refilled. Each time power was lost at this plant, sewage was discharged from an overflow vent next to the minimart into a concrete drainage ditch and then flowed behind the minimart into a mangrove swamp. While this was not considered acceptable, it did not pose an imminent health hazard because it was contained by the concrete ditch, did not adjoin yards or playgrounds, and drained into the mangrove swamp. The Public Works trouble desk was alerted to the problem and had promised to prevent a recurrence.

(4) Trash and garbage disposal. Trash volume was significantly increased by post-hurricane cleanup operations. Trash and garbage were being picked up on a daily basis at the dining facilities and the hospital. Although this was not frequent enough to prevent overflow of the dumpsters, it was sufficient to prevent fly breeding. Trash and garbage were disposed of in the Naval Station's sanitary landfill.

#### (5) Shelter.

- (a) On-base housing. Although nearly all housing units sustained damage, most damage involved broken windows and lost window screens. The concrete construction of the houses protected them from serious damage. While most families remained in their housing units, many dependents returned to CONUS. Those who remained in their housing units lived without lights, hot water, refrigeration and air conditioning. Broken windows and screens exposed residents to mosquitos (see disease vector assessment below). Residents either ate at the Anchor Inn or bought food at the commisary and cooked it on an outdoor grill or camp stove the same day.
- (b) Off-base housing. Many houses rented off base by single and married military personnel were severely damaged. Many of these personnel and their families were provided shelter at the transient BEQ.
- (c)  $\underline{B0Q}$ . Because the B0Q is located at one of the highest points on the Naval Station, water pressure was not restored to it during our visit. It also had no electric power. Some permanent B0Q residents were allowed to continue residing in the B0Q. Transient officers were housed in the transient B0Q
- (d) <u>BEQ's</u>. At the time of our visit the BEQ's had no electric power, but did have water pressure. The transient BEQ housed a wide variety of personnel including homeless military and civilian employees, transient officers and retired military. Despite this influx, the BEQ was not overcrowded and room partitions made spread of respiratory infections unlikely.
- (6) Endemic diseases. Because the Secretary of Health for the Commonwealth of Puerto Rico had declined offers of preventive medicine assistance made by COMNAVACTSCARIB, direct contact was not made with Puerto Rican health authorities. Based on discussions with Naval Hospital personnel, there were no known endemic diseases in the communities immediately surrounding the base which would pose a threat to the Naval Station.
- (a) Dengue fever, the only mosquito-transmitted disease endemic to Puerto Rico, reportedly occurs sporadically in the surrounding areas, but has not occurred on base.
- (b) According to the Disease Risk Assessment Profile (DISRAP), amebic and bacillary dysentaries, typhoid and paratyphoid fevers and hepatitis A are endemic to Puerto Rico. However, transmission of these and other enteric diseases to base residents was considered unlikely because of the well-protected water and good food sanitation on base. In response to inquiries, we recommended against the need for typhoid and cholera immunizations, and immune serum globulin for protection against hepatitis.

Cholera has not been reported in Puerto Rico and the vaccine is not effective in preventing outbreaks. Mass immunization for other diseases would have diverted scarce personnel resources and given a false sense of security to base residents. Emphasis on sanitary food handling, good personal hygiene (particularly hand washing), provision of potable water, and proper disposal of sewage, trash and garbage were recommended as the most effective means of controlling enteric disease transmission.

#### (7) Vector-borne disease potential and pest problems.

#### (a) Mosquitos.

- 1 The principal vector-borne disease threat in the Naval Station Roosevelt Roads area is dengue fever, which is transmitted by the mosquito Aedes aegypti. Since Aedes aegypti has a flight range of only about 100 feet and there is a broad uninhabited buffer zone inside the perimeter fence, direct transmission of dengue from off base to base residents was considered unlikely. Transmission from an infected Puerto Rican base employee was also considered unlikely. The only potential breeding site for Aedes aegypti identified during the assessment was the DRMO where old tires were stored. However, this is sufficiently isolated from work and residential areas to prevent transmission. Hurricane Hugo probably did not increase breeding in these tires since they will collect rain under normal conditions. As a long term control, tires should either be shipped to a recycler or be shredded.
- 2 There was a significant pest mosquito problem involving the salt marsh mosquito Aedes taeniorhynchus. This mosquito is an agressive biter, but does not transmit disease. Biting activity appeared to be high only during the period 1800-2000, becoming most intense at about 1830. Biting counts varied from a high of eight per minute per person at the Naval Hospital to very little activity in the area of the transient barracks. Biting activity appears to be dependent on wind direction. Large numbers of Aedes taeniorhynchus will fly upwind from the mangrove swamps where they breed.
- 3 Another pest mosquito, <u>Culex quinquefaciatus</u>, can be expected to increase over the next several weeks, particularly where sewage has drained into the mangrove swamp behind the minimart.
- 4 Mosquito control operations. Contracted pest control services were conducting truck-mounted ultra low volume (ULV) insecticide dispersal operations twice a day around housing and the BEQ's. These operations seem to be effective in the areas treated, but they are inadequately manned and equipped to service the entire base.
- (b) <u>Filth flies</u>. Significant problems with filth flies were not expected to occur because of frequent garbage pick up, proper management of the landfill and proper human feces disposal.

#### (c) Rodents.

- 1 Shortly after the hurricane, the Naval Hospital received numerous reports of rodent sightings in the housing areas, around the R&R Pizza and around the Naval Hospital. Based on reports of "coconut rats" in the trees before the storm, these were most likely roof rats (Rattus rattus). Rats meeting the description of roof rats were reportedly seen in the hospital warehouse, and one was trapped during our visit. The increased sightings of roof rats were probably related to destruction of their habitat. Roof rats in tropical areas are known to nest in trees, shrubs and vines, and to feed on nuts and fruit. Many trees on the Naval Station were felled by the hurricane. The remaining trees were severely damaged and stipped bare of leaves, nuts and fruit. Because of this, roof rats were forced to seek new harborage and to forrage for fruit and nuts scattered about on the ground.
- Active norway rat (<u>Rattus norvegicus</u>) burrows were observed near a culvert where the mangrove swamp adjoins a road, but were not observed around any of the food service facilities or food storage buildings. Continued frequent pick up of trash and garbage and proper landfill management should prevent any increase in norway rat breeding.
- (d) <u>Cockroaches</u>. The Anchor Inn and the R&R Pizza had light to moderate infestations of German cockroaches. With the increase in heat and humidity because of the loss of air conditioning and the expanded hours of operation, cockroach populations can be expected to flourish within three weeks.
- communicable disease, environmental health and disease vector surveillance. Existing surveillance activities of the Naval Hospital for communicable disease, potable water, food service sanitation, waste disposal and disease vectors were reviewed and were considered appropriate. They were advised not to intensify surveillance for communicable diseases such as gastroenteritis, since this could artificially increase reported disease incidence even when the actual disease incidence remains the same. It was recommended that they increase monitoring of selected facilities and services including food service, potable water, sewage disposal and garbage disposal to ensure that at least minimum standards are maintained continually. The personnel assigned to the Occupational Health and Preventive Medicine Department demonstrated themselves fully capable of conducting all necessary disease control, environmental health and disease vector surveillance aboard the Naval Station.

#### b. Conclusions.

- (1) The potential for outbreaks of communicable disease aboard the Naval Station appeared low.
- (2) COMNAVACTSCARIB, the Naval Station and the Naval Hospital were managing the public health aspects of hurricane recovery operations effectively. Essential health-related services, including sanitary food service, potable water, sewage disposal, trash and garbage disposal, public health surveillance and health care, were being provided. However, many of these services were dependent on continuous operation of fixed emergency

generators. Since these generators were not designed to operate for extended periods, intermittent loss of these services due to generator failure was considered likely.

- (3) Naval Hospital preventive medicine resources appeared adequate to carry out all necessary communicable disease, environmental health and disease vector surveillance. Augmentation of existing preventive medicine assets was not desired by the Naval Hospital.
- (4) Pest control equipment and personnel assets were insufficient to respond to the substantially increased need for mosquito and rodent control.
- c. Recommendation. A Vector Control Tesm should be sent to assist in controlling mosquitos and rodents aboard the Naval Station.
- 3. <u>Vieques</u>. An assessment of the Naval Ammunition Facility and Camp Garcia was conducted on 25 September 1989.

#### a. Findings.

#### (1) Naval Ammunition Facility (NAF).

- (a) <u>Potable water</u>. Potable water service had been restored to the island on 24 September, but pressure to the NAF was too low to raise the level of water in the storage tank. During our visit, pressure was lost due to a malfunctioning generator and reportedly restored again on the following day. Water in the NAF storage tank had been batch chlorinated by the facility's Independent Duty Corpsman. Samples were taken for bacteriological testing at Naval Hospital Roosevelt Roads.
- (b) <u>Food service</u>. The food service operation was well run. Handwashing facilities were provided and good personal hygiene practices were followed. Freezer temperatures were correct, but chill box temperatures ranged from 50 to 60 degrees F. Immediate repair of the chill boxes was recommended. Holding time requirements were observed and leftovers were not retained. General sanitation was excellent and no cockroaches were noted.
- (c) <u>Sewage disposal</u>. All toilets except a few at the lowest levels were functional. The small activated-sludge sewage treatment plant was not operational because of a lack of electric power. In the interim, untreated sewage was allowed to bypass the treatment plant into a leaching field. This did not appear to present any hazard.
- (d) Garbage and trash disposal. Contract waste removal had resumed prior to our visit. Before resumption of pick up, trash and garbage had been buried in a pit on the NAF and covered with several feet of earth.
- (e) <u>Disease vectors and pests</u>. No disease vectors were identified, but pest mosquitos were abundant. The predominant mosquito (<u>Psorophora confinnis</u>) is a persistent biter which usually bites at dusk. Mosquito control operations are normally performed by the same pest controllers as at Naval Station Roosevelt Roads, but had not been conducted since before the hurricane because of the demand on their services at the Naval Station. Hurricane damage prevents exclusion of mosquitos from the barracks. Insect repellents and bednets were unavailable.

#### (2) Camp Garcia.

- (a) <u>Potable water</u>. The normal source of potable water is well water which is chlorinated and then stored in two large storage tanks. This is then pumped up to a pressure tank on a hill above the camp. The hurricane partially destroyed the pump house, but approximately 50,000 gallons of water with a 0.4 ppm chlorine residual remained in the storage tanks. A tank truck was transferring this water to the pressure tank at the time of our visit. A water buffalo with approximately 200 gallons of water was being used by the Seabees pending restoration of water pressure.
- (b) <u>Food service</u>. The galley roof was destroyed during the hurricane. The Seabees were in the process of setting up a temporary galley in another building. A functional refrigerator, freezer and stove were salvaged from the old galley, but no dishwashing facilities were available. In the interim, meals ready to eat (MRE's) were being issued.
- (c) <u>Sewage disposal</u>. The port-a-potty had not been emptied since the storm. Burial of feces in a pit was recommended until pick up can be resumed.
- (d) <u>Disease vectors and pests</u>. The same pest mosquito was present at Camp Garcia as at NAF, but in much greater numbers. Biting counts ranged from 8-10 per minute per person at 1515 up to 14 per minute per person at 1620. Since this is a dusk biting mosquito, the biting rate can be expected to increase as sunset approaches.

#### b. Conclusions.

- (1) The potential for an outbreak of communicable disease at either NAF Vieques or Camp Garcia appeared low.
- (2) Preventive medicine assistance for the Vieques naval facilities did not appear necessary.
- (3) There was a significant pest mosquito problem at both the NAF and Camp Garcia. Naval Station Roosevelt Roads is incapable of providing required mosquito control support at the Vieques naval facilities due to increased demands at the Naval Station.
- c. Recommendation. The Vector Control Team recommended for Naval Station Roosevelt Roads should also provide mosquito control assistance at NAF Vieques and Camp Garcia.
- 4. <u>Saint Croix</u>. A brief assessment of conditions on Saint Croix was conducted on 26 September 1989.

#### a. Findings.

(1) Potable water. Potable water was being provided by the USS Pensacola (LSD 38) and two U.S. Army 600 gallon-per-hour reverse osmosis water purification units (ROWPU's). The USS Pensacola was making water by distillation in a berth near Hess Petroleum on the south-central side of the island. The source water was clear with no visible signs of pollution.

At the time of our visit, the water being provided by the Pensacola had no chlorine residual, but they indicated they would boost it to 2.0 ppm based on our recommendation. The two Army ROWPU's were located at the piers in Christiansted and Frederiksted at opposite ends of the island. Water from the ROWPU's was being chlorinated to a level in excess of 2.0 ppm. Potable water from these sources was being distributed by water trucks and water buffalos to Red Cross shelters, squares and shopping centers. Many buildings had cisterns to collect rain water. Some shelters chlorinated or boiled this water for drinking purposes. Reportedly many islanders were drinking cistern water without disinfection or boiling.

- (2) Food. MRE's had been distributed to the islanders and some shelters were able to prepare safe food (beans, rice and canned tuna fish). A good example of the latter was the American Legion shelter in Christiansted.
- (3) <u>Sewage disposal</u>. With no running water and no electricity on the island most toilets were not functional. One shelter (the American Legion again) used water from a cistern to flush toilets using buckets, avoiding problems with human feces disposal. However, in other shelters, and even in the Saint Croix Hospital, feces nearly filled the toilets. Many people on the island reportedly defecated and urinated on the ground for lack of other facilities.
- (4) <u>Garbage and trash disposal</u>. Most trash and garbage had not been collected since the hurricane and was piling up behind shelters, hospitals and homes. The landfill at Anguilla had limited land available for further dumping. At the time of our visit, trash collection had resumed to some extent and open dumping without earth cover was being practiced at the landfill.
- (5) Shelter. Many homes on the island had been destroyed. The Red Cross had established 10 temporary shelters around the island. Homeless islenders were provided cots, bedding, food and water at the shelters. The shelters visited did not appear overcrowded, but grouping people in open spaces like school gymnasiums can be expected to increase respiratory disease transmission.
- (6) Endemic diseases. According to local physicians, dengue fever occurs sporadically on the island. The prevalence of enteric and respiratory diseases prior to the hurricane was not determined.

#### (7) Vector-borne disease potential and pest problems.

#### (a) Mosquitos.

- $\frac{1}{2}$  Neither adults nor larvae of Aedes aegypti were observed in the areas visited. However, the extensive accumulation of trash and storm debris around the island can be expected to provide ample breeding opportunities in cans, buckets, tires and uncovered cisterns.
- $\underline{2}$  The pest mosquito,  $\underline{\text{Aedes taeniorhynchus}},$  was present in high numbers at the airport and probably on other parts of the island.

- (b) Filth flies. The common house fly (Musca domestica) was breeding prolifically in the accumulated garbage. Fly populations were expected to increase significantly in the following weeks.
- (c) Rodents. Rats reportedly were a problem prior to the hurricane. Rat populations can be expected to increase significantly in the following weeks because of the accumulations of trash and garbage.
- (d) Feral dogs. Several wild dogs were seen at the landfill. Although there was no reported animal rabies on the island, accumulated garbage may attract wild dogs into residential areas and increase the potential for dog bites.
- (8) Communicable disease, environmental health and disease vector surveillance. Based on discussions with the Commissioner of Health for the Virgin Islands and the Territorial Epidemiologist, there were insufficient health department personnel to conduct environmental health surveillance of shelters and surveillance for disease vectors. Mr. Barry from the Emergency Response Branch of the Centers for Disease Control (CDC), indicated that he had requested four multidisciplinary personnel with experience in natural disaster relief from CDC. The Commisioner of Health and the Territorial Epidemiologist indicated a need for additional resources to assist in monitoring for disease vectors, the sanitation of the shelters and the safety of drinking water.
- (9) The Atlantic Fleet Weapons Training Facility, Underwater Tracking Range suffered little storm damage and had no public health related problems except a shortage of potable water. Well water with no chlorine residual had been obtained from a local hotel and dispensed from a water cooler. A 150,000 gallon rain water cistern provided water for flushing, washing and showers. Samples of each of these sources were taken for bacteriological testing at Naval Hospital Roosevelt Roads. Results were to be provided by the Naval Hospital to COMNAVACTSCARIB. We recommended that potable water be obtained from the Army ROWPU at Frederiksted instead of from the hotel.

#### b. Conclusions.

- (1) The reports of sporadic cases of dengue fever on the island in the past suggests that infected individuals are present in the island population. The availability of many potential breeding sites in artificial containers makes a substantial increase in the <u>Aedes aegypti</u> mosquito population likely. In the absence of intensive efforts to eliminate potential breeding sites for <u>Aedes aegypti</u>, there is a potential for an outbreak of dengue fever.
- (2) There also appeared to be a significant potential for outbreaks of gastroenteritis and other diseases communicable by the fecal-oral route. Factors contributing to this potential include consumption of undisinfected water, contamination of food by filth flies breeding in accumulated garbage and feces, contamination of food by people unable to maintain adequate levels of personal hygiene, and lack of refrigeration.

- (3) Public health and pest control resources appear to be insufficient to conduct effective environmental health and disease vector surveillance, and to control pest populations.
- c. Recomendation. Based on the needs expressed by the Commissioner of Health and the Territorial Epidemiologist, we recommended that they request a Navy Preventive Medicine Team via the territorial government and the Federal Emergency Management Administration (FEMA). Upon our return to Naval Station Roosevelt Roads, we advised COMNAVACTSCARIB of this recommendation. The proposed composition of the team was an Environmental Health Officer, an Entomologist, three to four Preventive Medicine Technicians and a Laboratory Technician.

#### KEY POINTS OF CONTACT DURING THE ASSESSMENT

**	***	
N	AME	

#### TITLE

#### ORGANIZATION

#### Naval Station Roosevelt Roads:

RADM Moriarty CAPT Shaw CAPT O'Brien

Chief of Staff Commanding Officer Commanding Officer

Commander Naval Activities, Caribbean COMNAVACTSCARIB NAVSTA Roosevelt Roads

CAPT Wojtkowski CAPT Ashamalla

CDR Seible

LT Vazquez

LCDR Buselt

LT Ferguson

Commanding Officer Executive Officer Environmental Health Officer Supply Officer

NAVHOSP Roosevelt Roads NAVHOSP Roosevelt Roads NAVHOSP Roosevelt Roads NAVSTA Roosevelt Roads NAVSTA Roosevelt Roads

Atlantic Fleet Weapons Training Facility (AFWTF)

Vieques:

LT Grill HMC Vail Officer in Charge Independent Duty Corpsman

Food Service Officer

Vieges Detachment NAF Vieques

Saint Croix:

CDR Spicer LT Rhodeman Dr. Heath Dr. Lewis

Mr. Barry

Mr. Gill

Mr. Sullivan

Acting XO Medical Officer Commissioner of Health Territorial Epidemiologist

Emergency Resource Manager Environmental Health Dept. private contractor

AFWTF NAVHOSP Roosevelt Roads U.S. Virgin Islands U.S. Virgin Islands Emergency Response Branch Centers for Disease Control

Saint Croix HMS Pest Control

#### RADIO BRIEF RECORDED AT AFCN ROOSEVELT ROADS 24 September 1989 .

Let me introduce myself, I am CDR Perrault, COMNAVAIRLANT Environmental Health Officer. I have been here since Friday along with LCDR Stevenson, an Entomologist from Navy Environmental and Preventive Medicine Unit No. 2 in Norfolk, assessing the potential for disease outbreaks following Hurricane Hugo.

I know that many of you are worried about the possibility of an epidemic. In the past few days, LCDR Stevenson and I have carefully assessed the potential for an epidemic. Let me assure you that we see no potential for an epidemic of any kind. As long as safe water and food are provided, sewage and garbage are disposed of properly, and mosquitos are controlled, there will be no epidemic. Although water service was interrupted, it was never contaminated, and is being intensively monitored by the hospital for signs of contamination. The base water treatment plant was not damaged and continues to produce safe drinking water on emergency power.

The food served at the Anchor Inn is prepared in a sanitary manner and is safe to eat. Food sold at the commisary is also safe to eat. Prevention of food-borne illness requires only a few simple precautions: (1) use only unspoiled food, (2) keep protein foods cold or hot to prevent growth of bacteria and (3) wash your hands before handling food, especially after using the toilet.

Sewage and garbage disposal services are continuing, despite some difficulties.

Pest Control is spraying for mosquitos as often as possible. Some people are worried that the mosquito fogging is hazardous to people. Rest assured, the pesticide used has very low toxicity to people. Most of the mosquitos you see are salt marsh mosquitos that do not transmit disease. You can protect yourself from these mosquitos by staying indoors during the hours of 1800-2000 or by using insect repellents containing DEET.

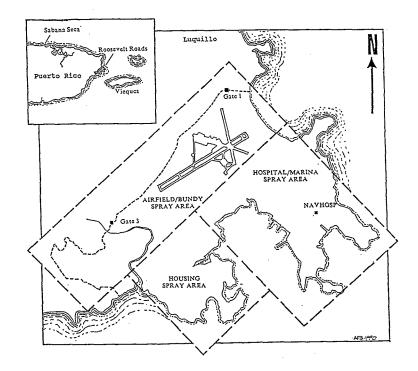
The mosquitos that transmit dengue fever breed only in artificial containers such as flower pots, cans or old tires. We have found very few of these dengue mosquitos during our survey. Since these mosquitos fly only about 100 feet from their breeding sites, you can prevent their breeding by disposing of trash and storm debris around the home that could contain water, and by emptying the water from flower pots and other artificial containers around the home. If you are storing water around the home for emergencies, keep the containers covered to prevent mosquito breeding.

Many of you have noticed rats in the housing area. These are roof rats that normally nest in the trees and eat fruit. Since the hurricane, many rats have lost their homes and are now forraging on the ground for fruit fallen from the trees. They are not aggressive toward people and do not carry rabies, but should be left alone.

There is no need for immunizations against cholera, typhoid or other diseases. These diseases can only be transmitted if they were already here and transmission can best be prevented by protection of food and water as mentioned before.

Let me say that I am impressed with the hard work and high morale of everyone here at Roosevelt Roads. Without the help of each of you, things could have been a lot worse.

# VECTOR CONTROL ACTIVITIES OF VCT-1



ROOSEVELT ROADS, PR

#### DEPARTMENT OF THE NAVY

NAVY DISEASE VECTOR ECOLOGY AND CONTROL CENTER NAVAL AIR STATION JACKSONVILLE, FLORIDA 32212-0043

> 6440 00/930601 2 NOV 1989

FIRST ENDORSEMENT on Team Leader (VCT-ONE) 1tr 6440 04/930401 of 1 Nov 89

Officer in Charge, Navy Disease Vector Ecology and Control From:

Center, Jacksonville

To: Commanding Officer, Navy Environmental Health Center

VECTOR CONTROL ASSISTANCE PROVIDED BY MMART VECTOR CONTROL

TEAM ONE AT ROOSEVELT ROADS, PR 29 SEP - 12 OCT 1989

1. Forwarded.

2. My congratulations have gone out to Vector Control Team One (VCT-ONE) for their outstanding efforts in the wake of Hurricane Hugo. From their efforts we have gained invaluable experience

ZIMMERMAN

and knowledge.

Copy to:

Team Leader LCDR T. W. Gale, MSC, USN



#### DEPARTMENT OF THE NAVY

NAVY DISEASE VECTOR ECOLOGY AND CONTROL CENTER NAVAL AIR STATION

JACKSONVILLE, FLORIDA 32212-0043

6440 04/930401 1 NOV 1989

From: Team Leader, Vector Control Team One (VCT-ONE)

To: Commanding Officer, Navy Environmental Health Center

Via: Officer in Charge, Navy Disease Vector Ecology and Control

Center, Jacksonville

Subj: VECTOR CONTROL ASSISTANCE PROVIDED BY MMART VECTOR CONTROL

TEAM ONE AT ROOSEVELT ROADS, PR 29 SEP - 12 OCT 1989

Ref: (a) COMNAVACTSCARIB ROOSEVELT ROADS, RQ 251230Z SEP 89

(b) NAVENVIRHLTHCEN NORFOLK VA 291815Z SEP 89

Encl: (1) Supplies and Equipment Inventory for VCT-ONE

(2) Areas Treated by Ground ULV Fogging at Roosevelt Roads

(3) Portable Electric Contingency Ultra-Low-Volume Sprayer

1. Executive Summary. On 29 September 1989 an MMART Vector Control Team (VCT-ONE) consisting of two medical entomologists and two preventive medicine technicians from the Navy Disease Vector Ecology and Control Center, (DVECC) Jacksonville, Florida, arrived at the Naval Station, Roosevelt Roads, Puerto Rico, to provide vector control assistance in the aftermath of Hurricane Hugo. The Team completed an extensive survey for mosquito breeding from the ground and air and initiated necessary control measures to protect Naval Station residents from mosquitoes. Spray routes designed to cover the entire Naval Station were developed and ground ultra-low-volume (ULV) fogging with malathion insecticide was conducted at dusk and dawn from 1 October through 11 October 1989. Mosquito populations were reduced to a minimum and a significant decrease in mosquito annoyance was experienced by Naval Station residents.

#### 2. Background

- a. During late September 1989, Hurricane Hugo swept through the Caribbean passing over the east end of Puerto Rico and then headed northwest over the Virgin Islands leaving a path of destruction in the wake of 200 mile per hour winds. It then continued on to the United States where it ravaged the city of Charleston, South Carolina, and surrounding areas. Damage to the islands of St. Croix, St Thomas, and Puerto Rico was extensive and widespread. Red Cross estimates of the injury to these areas included long-term power outages, 66,000 homes damaged or destroyed, significant water and gasoline shortages, and disrupted telephone services.
- b. The Naval Station Roosevelt Roads, Puerto Rico, and Navy detachments on the island of Vieques received the full force of Hurricane Hugo on 19 September and suffered extensive damage. Many family housing units lost all screens and windows, and electricity was out in most areas. A disaster assessment team

from the Navy Environmental Health Center reported there was no current threat from vector-borne diseases; however, rodents and pest mosquitoes were a problem. Due to the loss of screens and probable mosquito population increases following the hurricane, the Commander of Naval Activities Caribbean requested assistance (reference (a)) in controlling mosquitoes and rodents at Roosevelt Roads and Vieques.

c. On 28 September 1989 an MMART vector control team (VCT-ONE) from the Navy Disease Vector Ecology and Control Center, Jacksonville, Florida, was tasked by the Navy Environmental Health Center (NEHC) to provide mosquito and rodent control assistance to Naval Activities at Roosevelt Roads, (reference (b)). The team consisted of two medical entomologists, LCDR T. W. Gale, MSC, USN, and LTJG S. E. Rankin, MSC, USNR, and two preventive medicine technicians, HM1 W. E. Krothe, USN, and HM2 A. L. Gourley, USN. Vector surveillance and control supplies and equipment (enclosure (1)) and VCT-ONE team members were transported to Roosevelt Roads, by an Air National Guard C-130 on 29 September 1989. Additionally, a second Team (VCT-TWO) was dispatched to St. Croix to provide similar assistance.

#### 3. Personnel Contacted

Commanding Officer, Naval Hospital, CAPT Ashamalla Roosevelt Roads, PR CDR Seible Executive Officer, Naval Hospital, Roosevelt Roads, PR CDR Rodriguez Disaster Assistance Survey Team Coordinator, OPCON, COMNAVFORCARIB Head, Joint Movement Center, Opera-CDR Young tions Control, COMNAVFORCARIB Director for Administrative Services LCDR Quinones Naval Hospital, Roosevelt Roads, PR Assistant to the Chief of Staff. LCDR Knight OPCON, COMNAVFORCARIB Head, Preventive Medicine, Naval LT Vazquez Hospital, Roosevelt Roads, PR LT Wilson Preventive Medicine/Industrial Hygiene, NAVHOSP Roosevelt Roads, PR LT Carrell Preventive Medicine/Industrial Hygiene, NAVHOSP Roosevelt Roads, PR SDO, VC-8 Headquarters, NAVSTA LT Riley Air Field, Roosevelt Roads, PR HMC Ebright Naval Hospital Liaison for OPCON, COMNAVFORCARIB HMC Veil Independent Duty Corpsman, Naval Ammunitions Facility, Vieques LPO for Preventive Medicine, NAVHOSP, HM1 Muoio Roosevelt Roads, PR PMT, Preventive Medicine Service, HM1 Weller NAVHOSP, Roosevelt Roads, PR BU1 Stevens Mobile Construction Battalion Unit 7 Roosevelt Roads, PR

Mr. Reagan

Mr. Montes

Mrs. Rodriquez

Mr. Willie

Supervisor, Burns & Roe, Public Works Contractor
Pest Control Shop Leader, Burns & Roe, Public Works Contractor
Disaster Assistance Survey Team
Member, OPCON, COMNAVFORCARIB
Supervisor, MAC Cargo Terminal, NAVSTA
Air Field, Roosevelt Roads, PR

#### 4. Initial Vector Control Assessment and Coordination

- a. Upon arrival at the Naval Station, Roosevelt Roads, VCT-ONE members were provided billeting on a ward at the Naval Hospital because all other quarters were either closed due to damage and power outages or full. Permission was obtained from Public Works to use the pest control shop for vector control operations, and the vector control supplies and equipment were moved into that facility. Although vehicles were in short supply, two pick-up trucks were provided by the Naval Hospital to use during morning and evening mosquito control operations.
- b. Equipment and supplies were unpacked and inventoried on 30 September and found to be complete (enclosure (1)). All pesticides had arrived with the exception of 55 gallons of 91% malathion which had been shipped separately from Memphis, Tennessee. Arrangements were made with the pest control contractor to use some of his malathion until the drum arrived from Memphis. Three 55-gallon drums of malathion were shipped from Memphis to St. Croix. Two drums were left for VCT-TWO and one drum was transported from ST. Croix to Roosevelt Roads via CH-53 helicopter on 3 October.
- c. Equipment available at the pest control shop for mosquito adulticiding consisted of one Leco HD Ultra-Low-Volume (ULV) trailer-mounted sprayer. Pest controllers were spraying portions of the Naval Station with this equipment in the morning and evening each day.
- d. Maps of the Naval Station were obtained from Preventive Medicine and preliminary surveys for rodents and mosquitoes were initiated on 30 September. Mosquito light trap data from Preventive Medicine was reviewed and bite counts were taken at several locations on the Naval Station. A helicopter was provided by VC-8 on 3 October for VCT-ONE members to survey the mosquito breeding areas of Roosevelt Roads and Vieques by air. Hurricane damage observed from the air was extensive and vast areas of standing water could be seen in the mangrove forests on the Naval Station. Additionally, densely-matted vegetation blown over by the hurricane was covering large areas of the mangrove forests. Survey of these areas from the ground revealed standing water and mosquito larvae under the matted vegetation. The vegetation covering the water would have made the penetration of any mosquito larvicide very difficult if not impossible.

- (1) Aedes taeniorhynchus was the primary pest species of mosquito found in the light traps and during bite counts. Trap numbers and landing rates varied with location on the base, wind direction, and proximity to the mangrove forests. Landing rates varied from 1/man/minute to zero in some locations while the two active light traps were collecting 10/trapnight and 45/trapnight respectively. Conversations with housing residents and base security personnel yielded numerous complaints about mosquitoes "eating them alive."
- (2) There were no reported active Dengue cases in close proximity to the Naval Station; however, adults of the primary vector mosquito, Aedes aegypti, were found resting in old tires at the NEX tire store. No larvae were found in the tires or other water-filled containers.
- (3) Large numbers of <u>Culex quinquefaciatus</u> mosquito larvae were found in grass-covered depressions around the landfill in the Bundy area of the Naval Station and behind the NEX Minimart. The water in these areas contained the high organic content usually associated with these mosquitoes. As reported by the NEHC assessment team, sewage overflow was being released behind the Minimart providing ideal breeding conditions for these mosquitoes.
- (4) Very little rodent activity was found and only a couple of isolated reports of sightings were received from Naval Station personnel.
- (5) In addition to mosquitoes and rodents, Naval Station residents, including VCT-ONE members, were experiencing relentless attacks from <u>Culicoides</u> midges, known locally as "flying teeth" or "mi mis."

#### 5. Control Operations

- a. Briefings were held with personnel from Public Works, the Naval Hospital, and Operations Control for COMNAVFORCARIB prior to initiating pest control assistance. Additionally, VCT-ONE members traveled with the contract pest controllers during their normal mosquito adulticiding runs on the evening of 30 September and morning of 1 October to determine the extent of their coverage.
- b. In order to eliminate the annoyance of pest mosquitoes, thorough coverage of the entire Naval Station by ground ULV fogging twice daily with 91% malathion was necessary. Because of the large area of the base and limited window of time for optimum ULV fogging, at least three ULV sprayers would be required.
- (1) A news release was prepared and aired on the local Armed Forces radio station to inform Naval Station residents of the increased mosquito control efforts of the Vector Control Team. Additionally, residents were cautioned to avoid close

contact with the fogging vehicles, if possible. They were informed that although the malathion ULV fog was not acutely toxic to humans it could sting the eyes and has an unpleasant odor.

- (2) Spray routes to cover the entire Naval Station were developed and coordinated in cooperation with the pest control foreman. The pest control shop's ULV sprayer and two truckmounted units from VCT-ONE were used to cover the new routes. The Naval Station was divided into three basic areas which included Housing, the Air Field/Bundy area, and the Naval Hospital/Marina area (enclosure (2)). Daily ULV spraying for the entire Naval Station commenced on 1 October and continued through 11 October. In order to control the mosquitoes during their greatest activity time and under the best weather conditions for ULV fogging, spraying was performed in each area from 0430 to 0730 each morning and from 1730 to 2100 each evening. After three days of continuous spraying, mosquito bite counts and light-trap counts dropped to almost zero. Many housing residents commented positively about the reduction of the mosquitoes and found they could enjoy pest-free outdoor cooking in the evenings.
- (3) VCT-ONE equipment used during ULV fogging operations included two electric contingency ULV units which were assembled at DVECC, Jacksonville, and a MicroGen G-4 gasoline powered ULV sprayer. Each contingency ULV unit consisted of a rotary nozzle coupled with an electric pump which could be connected to the battery of any truck or automobile with a 12 volt system (enclosure (3)). Pesticide for these units was provided by inserting the uptake tube from the pump into a five-gallon pesticide can.
- c. Mosquito larviciding had been performed by the pest control shop prior to the arrival of VCT-ONE. Altosid (TM) briquettes had been placed in most of the drainage ditches and low areas on the Naval Station which were holding water. Surveys of these areas yielded very few mosquito larvae. The extensive mangrove forests on the Naval Station had not been treated with a mosquito larvicide and did show mosquito breeding activity. However, the large area involved and the difficulty in getting pesticide penetration due to the matted vegetation caused by the hurricane prevented treatment of these areas.
- d. In addition to the morning and evening ULV fogging, several locations around the base were treated during the day with pyrethrum in a thermal fogger to eliminate resting Aedes aegypti in old tires and filth flies around dumpsters.
- e. Filth flies were a significant problem around food service facilities. Shortly after the hurricane, the EM dining facility had been set up to provide free meals for everyone, 24 hours a day, and had been operating in this mode for about 10 days. Since there was not enough emergency power to run the air conditioning, all doors and windows were open and the facility

was full of filth flies. While the 24-hour food service operation was in effect, Flytek fly bait was placed around the outside of the building and the dumpsters were treated with a residual application of Dursban. After full power was restored and the 24-hour food service operations ceased, the facility was closed and fogged inside with 3% pyrethrum to eliminate all flies inside the facility.

- f. Several rats were reported in the hospital and the EM dining facility on 10 October. Rat traps were provided to the Preventive Medicine Service with instructions on proper placement and use in the hospital. VCT-ONE and personnel from Preventive Medicine set traps in the EM Dining Facility. VCT-ONE departed Roosevelt Roads before the results of the trapping could be observed.
- 6. Vector Assistance For Vieques. On 6 October LCDR Gale and LT Vazquez were ferried to Vieques on the YFU to assess the extent of mosquito and rodent problems at NAF and Camp Garcia. The report from the assessment team had indicated heavy mosquito activity, primarily from Psorophora confinnis. Additionally, HMC Veil had reported a problem with rats in the overhead of the barracks at NAF.
- (1) The hurricane damage to Camp Garcia was severe with many of the buildings totally destroyed. Only a few personnel were on the base conducting clean-up and restoration operations. No pest problems were reported by the small number of personnel at that facility.
- (2) Hurricane damage to NAF included loss of electricity and damage to the roof of the barracks. This caused water damage to the interior and also allowed rats to enter this building. Spring rat traps were provided to HMC Veil with instructions on proper placement and baiting. Additionally, arrangements were made to apply Maki rodenticide to eliminate all rats in the building once repairs to the roof were completed.
- (3) There was very little standing water on Vieques due to a lack of rain since the hurricane. Although mosquito biting had been severe shortly after the storm, no current mosquito problem existed. Heavy biting by Psorophora confinnis was usually experienced several days after rain and gradually decreased unless more rain fell. No means of controlling mosquitoes was available on Vieques, and military residents were relying on screens and insect repellent for protection. The inclusion of on-call mosquito control for NAF, Vieques, in the next pest control contract was discussed with LT Vazquez.

#### 7. VCT-ONE Assistance To Sabana Seca

a. On 9.October LTJG Rankin, HM1 Krothe, and HM2 Gourley traveled to NSGA, Sabana Seca, to assess the pest problems at that facility. Base personnel were questioned about mosquitoes and reported no problems. Some problems with Mimi populations

were reported but were actually less than normal. Very little standing water was present on the base and no mosquito larvae were found in the small amount of water present. Areas reported to be problems in the past were surveyed by team members and no adult or larval mosquitoes were found in these areas.

b. The pest control contractor was adulticiding for mosquitoes regularly twice per week and this seemed to be sufficient for the current pest population. The team returned to Roosevelt Roads on the evening of 9 October finding no requirement for pest control assistance at NSGA, Sabana Seca.

#### 8. VCT-ONE Assistance to VCT-TWO

- a. On 6 October, LTJG Rankin traveled via helicopter to St. Croix with supplies requested by VCT-TWO. Tools for repairing pest control equipment and Flytek flybait were provided.
- b. While on St. Croix, LTJG Rankin was apprised of the situation there and toured the area with HMCS Roden. Additionally, he accompanied LT Conlon and LCDR Stevenson during inspections of dump sites and treatment of a large food storage warehouse for flies. He returned to Roosevelt Roads on the evening of 6 October.
- c. VCT-ONE was notified by NEPMU-2 of a shipment of four one-gallon sprayers which had been sent to Roosevelt Roads for transfer to St. Croix. This shipment could not be located by VCT-ONE at any of the possible receiving locations at Roosevelt Roads, and NEPMU-2 was notified of the problem.

#### 9. Special Assistance for Luquillo

- a. The DAST coordinator was contacted by the Assistant Mayor of Luquillo for assistance in dealing with the disposal of 75,000 dead chickens. This request was passed on to VCT-ONE for investigation and recommendations. Mrs. Rodriguez accompanied LCDR Gale, HMI Krothe, and BUI Stevens to the City Hall of Luquillo on 8 October for a meeting with the Assistant Mayor. The Assistant Mayor conveyed her concern over the odor and potential for flies and disease problems associated with 75,000 dead chickens at a large chicken farm near Luquillo.
- b. The team, accompanied by an assistant from the Mayor's Office, arrived at the chicken farm and found that most of the dead chickens had already been buried in three trenches at a depth of ten feet. The trenches were filled with about seven feet of dead chickens and covered with lime and about three feet of soil. The heavy equipment for digging the trenches was provided by the Department of Agriculture along with the recommendation for burial. Additionally, follow-up by the Department of Agriculture was to include application of a residual insecticide to the burial areas to prevent fly problems. The team told the assistant from the Mayor's Office that the

problem had been handled by the local authorities and there was no need for further assistance.

#### 10. Equipment Performance

- a. During extended use of any pest control equipment, malfunction and failure of that equipment is almost inevitable. Several problems with the pesticide dispersal equipment used by VCT-ONE were experienced and unfortunately occurred on the same day, 5 October. Repairs were possible on most of the equipment and the temporary loss of a particular piece of equipment did not halt pest control operations. These problems were anticipated and extra parts and equipment were brought for that purpose.
- (1) The Microgen G-4, gasoline powered ULV sprayer, developed a severely clogged air filter and would not run at full power. Since no spare filter was available and the paper element of the filter was not washable, a temporary filter was constructed with  $4 \times 4$  gauze pads. The new filter worked well and the sprayer ran fine during the rest of the deployment.
- (2) One of the contingency ULV sprayers had a problem with the rotary nozzle vibrating loose and falling off. A lock washer was used to help secure the nozzle and that corrected the problem.
- (3) The other contingency ULV sprayer developed cracks in the tubing at the pump junction. Although this tubing was replaced several times, cracks still developed causing loss of pressure and leaks. LTJG Rankin brought tubing back from VCT-TWO on St. Croix which worked a little better than the previous tubing.
- (4) Problems with the electrical system of the thermal fogger prevented the unit from being started on several occasions. The battery was replaced but the unit continued to operate sporadically throughout the rest of the deployment.
- (5) The Leco P-1 hand-held ULV unit operated sporadically and was difficult to start. The gas/oil mixture for the two-cycle engine was leaned a little and that helped some.
- b. During mosquito ULV fogging operations, difficulty in preventing the spray vehicle from being contaminated with malathion was experienced with the Microgen G-4 and the "Emergency" ULV units. Additionally, the Microgen G-4 required an operator to sit in the back of the truck with the sprayer which exposed the operator to malathion. Although proper personnel protective equipment was used by the operator this exposure should be limited, if possible.
- (1) Reduction in the amount of malathion contaminating the spray vehicle using the Microgen G-4 was achieved by resting the Unit on the tailgate of the pick-up truck.

(2) The amount of contamination with the contingency ULV units was greatly reduced once the nozzle was extended above the height of the truck cab which provided optimum air flow.

#### 11. Recommendations For Roosevelt Roads and Vieques

- a. Current equipment and personnel assigned to pest control operations at Roosevelt Roads are not adequate to cover the Naval Station. Two additional ULV sprayers, and vehicles and personnel to operate them, are needed to provide adequate control during heavy mosquito activity.
- b. Mosquito adulticiding should be provided for Vieques when warranted by heavy mosquito activity. The pest control contract should be modified to include this support. Additionally, general pest control support, including rodent control, should be made available to NAF and Camp Garcia.
- c. Preventive Medicine should establish a routine surveillance program for Aedes aegypti on the base. Oviposition traps should be used and artificial water containers should be checked regularly. Old tires and other containers should be removed or emptied, when possible.

#### 12. Recommendations For Future MNART Deployments

- a. The continued development or procurement of small, portable and reliable pesticide application equipment should be pursued.
- b. MMART pesticide dispersal equipment should be operated for extended periods of time prior to deployment to work out the "bugs" and determine what maintenance problems will arise.
- c. Vehicle support arrangements need to be made, when possible, prior to deployment. A lack of vehicle support for pest control operations severely limits the capabilities of a Vector Control Team.
- d. For disaster relief operations, Mobile Construction Battalion Units are routinely deployed to provide assistance. Although they have preventive medicine assets they rarely bring them along. The assignment of an MMART Vector Control Team with deploying CB Units would provide for transportation requirements and help support the CB Unit as well.
- e. In the event pesticide supplies become depleted and the normal resupply mechanism is too slow, provisions for local purchase of pesticides should be available to the Vector Control Team Leader.
- f. In the event of MMART deployments to several areas simultaneously, increased supplies and equipment are needed in the MMART AMAL. The establishment of a second complete Vector

Control AMAL at DVECC Jacksonville is recommended to alleviate the problem of splitting blocks prior to deployment.

- g. The following recommendations for additions to AMAL # 0026 are provided:
- (1) Increase the number of battery operated insect aspirators from 1 to 3.
  - (2) Increase the number of dippers from 2 to 4.
  - (3) Include a case of the new DEET cream formulation.
  - (4) Include 2 mosquito adult emergence containers.
- $\ensuremath{(5)}$  Include six collapsible poles for the insect nets and dippers.
  - (6) Include a case of permethrin tick repellent.

#### 13. Departure

- a. The vector control supplies and equipment were boxed and banded on 11 October and manifested for shipment via MAC on 12 October. The equipment arrived at DVECC Jacksonville on 24 October.
- b. VCT-ONE personnel departed from San Juan, Puerto Rico, via commercial flight and arrived at DVECC Jacksonville on 12 October.

#### 14. Conclusions

- a. Although no real vector-borne disease threat existed for military personnel at Roosevelt Roads or Vieques, the annoyance from mosquitoes was a significant factor which compounded frustrations from losses of electricity, damaged housing, missing screens and windows, and short food and water supplies. Controlling the mosquitoes contributed significantly to improving the morale of the Naval Station residents. In addition, shortfalls in the current Naval Station mosquito control program were identified and solutions for improving the program were provided.
- b. This deployment provided an excellent opportunity to test the capabilities of MMART equipment and provided outstanding on-the-job training for MMART personnel. The overall success of this mission and lessons learned will serve to improve contingency vector control support during future deployments.

#### 15. Acknowledgments

a. LTJG Rankin, HM1 Krothe, and HM2 Gourley are to be commended for their outstanding exemplary performance during this MMART deployment. They worked long hours under difficult

conditions and demonstrated superb initiative and flexibility while providing effective disease vector surveillance and control.

- b. Special thanks goes to LCDR Wooster who consistently provided outstanding logistical and moral support as the DVECC, Jacksonville, MMART Coordinator.
- c. Although the fast response to the request for vector control assistance created transportation and billeting problems for the Vector Control Team, these problems were quickly resolved by the staff of the Naval Hospital, Roosevelt Roads. Their continued support throughout the deployment significantly enhanced the completion of the MMART mission. Additionally, the support and assistance provided by personnel from the Preventive Medicine Service helped expedite mosquito surveillance and control efforts.
- d. The Public Works Department and the pest control contractor provided much needed space to operate from and pesticides when supplies were low. Their support contributed significantly to the successful completion of this evolution.

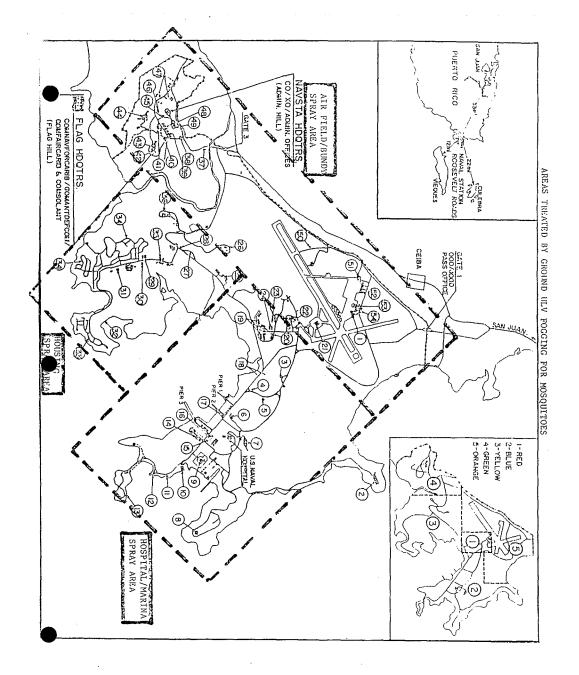
T. W. GALE

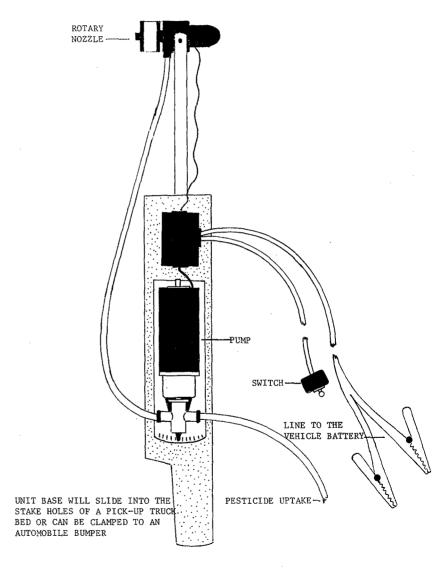
#### SUPPLIES AND EQUIPMENT INVENTORY FOR VCT-ONE

QUANTITY	ITEM DESCRIPTION
2 1 1	PORTABLE ELECTRIC "EMERGENCY" ULV SPRAYERS SPARE PARTS KIT FOR "EMERGENCY" ULV SPRAYERS MICROGEN G-4 GASOLINE POWERED ULV SPRAYER
1 1 2	LECO P-1 HAND HELD GASOLINE POWERED ULV SPRAYER HAND HELD THERMAL FOGGER FIVE GALLON CANS, DURSBAN 1.5 INSECTICIDE
6 2	43 OZ. BOTTLES, 3% PYRETHRUM FOGGING CONCENTRATE ONE GALLON CANS, 1% PYRETHRUM FOGGING CONCENTRATE
1 2 1	CASE (25 CANS) TOSSITS MOSQUITO LARVACIDE ONE GALLON CANS, FLYTEK FLY BAIT CASE (24 CANS) 2% D-PHENOTHRIN INSECTICIDE
1	CASE (12 CANS) PERMANONE TICK REPELLENT CASE (48 BOTTLES) DEET INSECT REPELLENT
1 6 16	11 LB. BUCKET, MAKI RODENTICIDE DISPOSABLE PESTICIDE RESPIRATORS PAIRS, NEOPRENE GLOVES
2 4 1	PAIRS, LEATHER WORK GLOVES AURAL PROTECTORS GRADUATED CYLINDER, PLASTIC
1 1	2 LBS, RAGS VOLTMETER
$\begin{matrix}1\\1\\24\end{matrix}$	TOOLBOX AND TOOLS METAL FUNNEL SPRING RAT TRAPS
10 3 1	COTTON COLLECTING BAGS ONE QUART PLASTIC BOTTLES FIVE GALLON PLASTIC BOTTLE
4 4	PARKAS, INSECT REPELLENT COTS, FOLDING NYLON
4 16 8	NETTING, MOSQUITO COT POLES CANTEENS
4 4 1	WEB BELTS SLEEPING BAGS AMAL # 0026, RAPID ASSESSMENT BLOCK INCLUDING:
1	1 ASPIRATOR, INSECT, BATTERY OPERATED 36 BATTERY,1.5V, D , DRY ALKA POWER CELL
	12 FLASHLIGHT, RANG 11-2V 1 FLASHLIGHT, 2 CELL 3 SPONGE, SURGICAL, 8-PLY, GAUZE, 4"x4", 200'S
	1 FORC PLACENTA KEL 12 IN 1 SCISSORS, IRIS, STRAIGHT, 4-1/4" 2 SYRINGE, IRRIGATION, GLASS, 4 OZ.
	1 FORCEPS, UTILITY, STRAIGHT, SMALL 1 BOX, PIPET, DROP, GLASS, 12S 1 BOX, JAR, SCREW CAP, 12S
	2 Daily Older, Solder Cont., 100

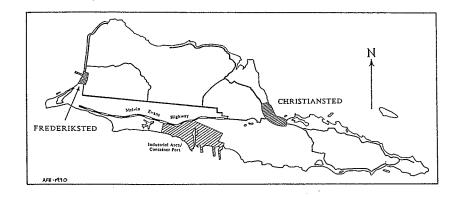
1 BOX, SLIDE, MICRO, PLAIN 72S 1 SUCTION TUBE ASPIRATOR

- 1 BOTTLE, INSECT MOUNTING MEDIUM
- 1 WASH BOTTLE, LAB, 250ML
- 2 BULB, DROP PIPE, 11-2IN2
- 1 PINNING SPECIMEN FORCEPS
- 1 FORCEPS, MICRO SLIDE 1 HOLDER, DISSECT NEEDLE
- 1 6 INCH RULE
- 1 BOX, TEST TUBE, 25X150MM 12S
- 1 BOX, COVER, GLASS, 22MM, 1 OZ. 1 BOX, BAG TISSUE SPEC 250
- 2 INSECT NETS
- 1 CONTRAST PLATE
- 1 POCKET MAGNIFIER, FOLDING, 1/2"
- 2 DIPPER, KITCHEN, WHITE 2 BOXES, LEAD, PENCIL, STANDARD HB #2 BLK MECH
- 1 BOX, PROTECTOR, DOCUMENT (50 PER BOX)
- 1 BOX, MECHANICAL PENCILS, (12 PER BOX)
- 1 BOX, PENCIL, CHINA MARK (12 PER BOX) 3 BOOK, MEMO, FLEX 31-2X6
- 1 PACKAGE, 3X5 INDEX CARDS
- 1 PACKAGE, GUMMED LABELS
- 1 BOX, PAD, RULED 8X10 1-2YL, (12 PER BOX)
- 1 BRUSH, INLAY, ND 3
- 3 OINTMENT BOXES
- 1 COMB, HAIR, HARD RUBBER





# VECTOR CONTROL ACTIVITIES OF VCT-2



ST. CROIX, VI



#### DEPARTMENT OF THE NAVY

NAVY DISEASE VECTOR ECOLOGY AND CONTROL CENTER

NAVAL AIR STATION

JACKSONVILLE, FLORIDA 32212-0043

6440 00/930702 3 NDV 1983

FIRST ENDORSEMENT on Assistant Team Leader (VCT-TWO) 1tr 6440 05/930701 of 3 Nov 89

From: Officer in Charge, Navy Disease Vector Ecology and Control

Center, Jacksonville

To: Commanding Officer, Navy Environmental Health Center

Subj: DVECC JAX VECTOR CONTROL TEAM TWO AFTER ACTION REPORT

1. Forwarded.

2. My congratulations have gone out to Vector Control Team Two (VCT-TWO) for their outstanding efforts in the wake of Hurricane Hugo. From their efforts we have gained invaluable experience and knowledge.

Copy to:

Team Leader LT J. M Conlon, MSC, USN



#### DEPARTMENT OF THE NAVY

NAVY DISEASE VECTOR ECOLOGY AND CONTROL CENTER
NAVAL AIR STATION
JACKSONVILLE, FLORIDA 32212-0043

6440 05/930701 **3** NOV 1989

From: Assistant Team Leader, Vector Control Team Two (VCT-TWO)

To: Commanding Officer, Navy Environmental Health Center

Via: Officer in Charge, Navy Disease Vector Ecology and Control

Center, Jacksonville

Subj: DVECC, JAX VECTOR CONTROL TEAM TWO AFTER ACTION REPORT

Ref: (a) OPNAV Memo 932D1-176-89

Encl: (1) Vector Surveillance and Control Activities at St. Croix,

U. S. Virgin Islands, Following Hurricane Hugo - 1989

(2) Lessons Learned from Vector Control Operations at St. Croix, U. S. Virgin Islands, 29 Sept - 11 Oct 1989

- 1. As directed by reference (a), Navy Disease Vector Ecology and Control Center, Jacksonville, deployed LT Joseph M. Conlon, MSC, USN, Medical Entomologist, and HMCS Ken Roden, USN, Preventive Medicine Technician, to St. Croix, U. S. Virgin Islands on 1 October 1989 as part of an MMART deployment. Both team members joined one medical entomologist and two preventive medicine technicians from Navy Environmental and Preventive Medicine Unit Two and were designated Vector Control Team Two.
- 2. Vector Control Team Two conducted vector surveillance and control measures as part of the humanitarian assistance offered to St. Croix in the aftermath of Hurricane Hugo. The team conducted operations for eight consecutive days prior to return stateside. Team activities and an island profile are provided in enclosure (1). Enclosure (2) represents a summary of lessons learned from the deployment and recommendations for future deployments.

3. Points of contact for technical discussion on the findings listed in enclosures(1) and (2) may be directed to LT Joseph M. Conlon, MSC, USN, or HMCS Ken Roden, USN, AUTOVON 942-2424 or commercial (904) 772-2424.

J. M. CONLON

VECTOR SURVEILLANCE AND CONTROL ACTIVITIES ON ST. CROIX, U.S. VIRGIN ISLANDS FOLLOWING HURRICANE HUGO--1989

#### BACKGROUND

#### A. <u>Island Profile</u>

The island of St. Croix is situated approximately 60 statute miles southeast of Puerto Rico in the Carribean Sea. The largest of the U.S. Virgin Islands at 218 sq km, St. Croix has a population of 55,000 located mostly in the two major cities of Christiansted and Fredericksted, on the northcentral and western sides of the island, respectively. The southern half of the island is flat, with a coral base. The northern half of the island is hilly, with numerous valleys separating hillside housing. The major source of income is tourism. However, the worlds largest refinery (Hess), co-located on the southern shore with the VIALCO alumina processing plant, are the largest single employers. The island has a tropical climate tempered by trade winds. Average temperature is 79F.

#### B. Disaster Account

At approximately midnight on 17 September , Hurricane Hugo struck St. Croix with sustained winds of 175-185 mph and gusts up to 235 mph. In addition, 5 tornados were recorded at the trailing edge of the storms eye. The hurricane struck the flat south-central portion of the island at midnight and travelled on a northwesterly route, exiting the island at 0500 hrs.

Casualty figures are still uncertain but current estimates indicate 19 fatalities with an unknown number of injured. Over 95% of the structures on the island were damaged with up to 25% being totally destroyed. Most of the heavy damage occurred on the flat southern coastal plain and windward hillsides. Tidal surges were smaller than expected, reaching 6 1/2 ft. maximum. Intraisland phone communications were not expected to be fully restored until March 1990. Off-island communication from 5 phonesets at the main switching center were operative at 17 days post-hurricane. Electrical service to Christiansted and Fredericksted is expected by the end of 1989, with service to 90% of the island by April 1990.

#### C. Vector Control Team 2

Due to the widespread destruction and disruption of vital public services, it was anticipated that vector-borne diseases historically present might increase to transmission threshhold. In particular, fly, mosquito, and rodent populations were expected to rise dramatically if preventive and curative control measures were not applied. Per DOMS tasking #28-2 and coordinated through OP-932 and BUMED 27, an MMART Vector Control Team consisting of two Navy medical entomologists and three preventive medicine technicians was dispatched to St. Croix for vector control assistance. Designated as Vector Control Team 2, the team

reported to the COMNAVACTSCARIB liaison on site and coordinated field activities with the Director of Community Health Services for the Virgin Islands and the Commissioner of Health, St. Croix. In addition, liaison was maintained with the Federal Emergency Management Agency (FEMA) and the Virgin Islands Territory Emergency Management Agency (VITEMA) for program coordination. As configured by NEHC, Vector Control Team 2 consisted of LCDR. H. R. Stevenson (Team Leader) and HMIs E. Pressley and A. Cardwell from the Navy Environmental and Preventive Medicine Unit 2, Norfolk, Virginia and LT. J. Conlon and HMCS K. Roden from the Navy Disease Vector Ecology and Control Center, Jacksonville, Florida.

The strategies developed to provide vector control consisted of: (1) Reconnaissance of the island by land vehicle to survey and assess mosquito, rodent, and filth fly populations; (2) Providing pesticide supplies, equipment, and vector control expertise to the St. Croix Public Health Department; (4) Providing training to additional Public Health personnel and Virgin Islands National Guard Environmental Health Technicians in order to ensure program continuity after the teams departure; (5) Assisting in the control of vectors and their breeding sites by application of ULV and low dosage pesticides where applicable.

#### D. Officials Contacted

Official personnel contacted during the visit included:

MG Moorehead, Adjutant General, Virgin Islands National Guard

COL Sefton, Asst. Adjutant General, Alabama National Guard

CAPT Headley, USPHS, NIH, Bethesda, MD

CAPT Sass, USPHS, NIH, Bethesda, MD

CDR Grey, USPHS, NIH, Bethesda

CDR Spicer, Representative to Commander, Naval Activities Carribean

CDR Sullivan, USPHS, NUH, Bethesda, MD

CDR Tonat, USPHS, NIH, Bethesda, MD

LCDR Glover, USPHS, NIH, Bethesda, MD

MAJ Walters, Environmental Sciences Officer, 18th Airborne Corps

MAJ Sellers, Executive Officer, Alabama National Guard

MAJ Lyda, Operations Officer, Alabama National Guard

LT Rhodeman, Medical Liaison, USNH, Roosevelt Roads, Puerto Rico

SSG Harold, PMT, 18th Airborne Corps

DR. Heath, Commissioner of Health, Virgin Islands

DR. Green, Deputy Commissioner of Health, Virgin Islands

DR. Lewis, Public Health Director, St. Croix

DR. Connell, District Health Officer, St. Thomas

MS. Karen Fergusen, Health Educator, District Health Office, St. Thomas

Ms. Lorna Smith, Asst. Director, Environmental Health, St.
Thomas

Ms. Jonetta Crowe, Chairman-Nursing, St. Thomas Dept. of Health, St. Thomas

Mr. Morgan Daniel, Field Supervisor, Div. of Environmental Health, St. Thomas

Mr. Eustace Peets, Vector Control Specialist, Div. of Environmental Health, St. Thomas

Mr. Gill, Field Supervisor, Div. of Environmental Health, St. Croix

Mr. V Williams, Vector Control Specialist, Div. of Environmental Health, St. Croix

Mr. Quinones, FEMA Public Information Office

Mr. Sydel, FEMA Accounting

Ms. Hines, VITEMA Public Information Office

Mr. Skinner, HMS Pest Control, St. Croix

Mr. D. Sullivan, HMS Pest Control, St. Croix

#### 2. OPERATIONS

#### A. Mosquito Control

Extensive surveillance revealed large populations of <u>Aedes aegypti</u> breeding in various containers in all populated areas of the island. Flower pots, indoor cisterns, and old tires appeared to be preferred breeding and resting sites. A prolonged dry spell reduced sunlit outdoor breeding to low levels. An extensive media

campaign aimed at awrareness and reduction of breeding sites appeared to be successful based upon random discussion with homeowners. Surveys conducted in housing developments located outside urban areas provided a means to educate those not having access to media services. In addition, it served to foster cooperation with residents whose only contact with relief efforts was through VCT-2 mosquito abatement services. Aedes taeniorhynchus caused some outdoor biting and was targeted by nightly ULV spraying. Surveys for breeding habitat of this species proved negative, probably due to habitat disturbance by tidal flushing. Although St. Croix is considered malaria-free, Anopheles albimanus, a competent vector, was discovered breeding in abundance in a large sunlit swampy area 1/2 mile south of an MP billeting compound. This area was promptly treated with Pyrenone Tossits and Dursban 10CR and the problem abated.

Beecomist XL 10s and 20s were utilized for adult mosquito control and performed flawlessly. Their compact size and low noise levels especially lend themselves to use in disaster relief roles were heavy duty vehicles might not be available. In addition, the necessary parts can be removed from the chassis easily and occupy only 2 cube, making them easily transportable. At least one should be a part of any MMART deployment block.

#### B. Fly Control

Filth flies were a major problem throughout the island. The magnitude of the garbage/trash removal problem precluded separation and proper disposal of organic waste from other debris. Burning at the main dump site was not an option due to its location directly east of the main airport runway. Backpack sprayers were utilized to control breeding at other disposal sites and offered a measure of control even at a few the larger dumpsites. Dursban 4E was used and gave excellent results. The versatility of Dursban 4E in both fly and mosquito control was well proven in many control contexts and recommends its use in future deployments.

#### C. Support

Outstanding support for VCT-2 was given by components of the Alabama National Guard in terms of lighting, tent setup, water provision and trash removal. This cooperation underscored the need to establish and maintain good relations with other units in order to share amenities. This is particularly important where goods and services are not readily available or must be shared.

Although vehicles for use in spraying operations were not available upon arrival through Public Health Department channels, persistance by the Team Leader eventually resulted in three trucks. In the meantime, rental utility vehicles were used as spray platforms. The small size of the Beecomist XL10s made them ideal for this purpose.

#### 1.PRE-DEPLOYMENT

- A. Problem: MMART team members eligible for deployment were not fully prepared to respond to the 3 hr. deployment notice.
- B. Discussion: Although a pre-deployment survey of St. Croix had been made and a written assessment was available, MMART members were not given an outbrief by its author. A round-table discussion might have clarified some misconceptions that were later to effect preparations when the deployment order was given. A clear concept of the inadequacy of basic services on St. Croix would have allowed for provision of requisite equipment maintenance materiel, e.g., rags, Chem-Mist, tools, etc. In addition, a more site-specific inventory of equipment could have been prepared and pre-shipment provisions made.
- C. Recommendations: Given the often unpredictable nature of MMART deployments, particularly in response to natural disasters, every effort should be made to ensure preparedness for the widest variety of scenarios, particularly those currently significant. Thus, anecdotal medical information concerning potential deployments, should be accessible by team members whenever available. The dissemination of this information is within the purview of both the MMART coordinator and the Medical Information officer. Mechanisms for its utilization should be explored and implemented, possibly through in-service training.
- All vector control equipment and pesticides requiring special packaging for shipment should be identified and arrangements made for said packaging to be on hand as soon as possible. This should include equipment not designated in the current Vector Control Block.

#### 2. TRANSPORTATION

- A. Problem: Transportation arrangements to and from St. Croix were inexact and resulted in personnel arriving on separate days.
- B. Discussion: Members of Vector Control Team 2 (VCT-2) were deployed from 2 separate commands in 2 widely separate localities. Under more propitious circumstances, with a longer time for adequate preparation, this would not have caused a problem. However, in the rapid preparations occurring during call-up and the mass of communications required to coordinate outgoing flights, signals got crossed and team members were dispatched on different flights. This would have been obviated had all team members been drawn from one command. In light of the confusion inherent in any disaster scenario, but particularly acute in one involving total communications breakdown at the

receiving command, coordination should be kept as simple as practicable.

The C-130 utilized by VCT-1 as transportation to Puerto Rico was initially dedicated for transport of VCT-2 to St. Croix. This was not known to cognizant DVECC and NEPMU-2 personnel until after the flight had departed. Although a C5A Galaxy was ultimately arranged for dispatch of VCT-2 to St. Croix, no flight was dedicated to return VCT-2 stateside. As the team had a 364-L palletload of equipment with which to return, opportune lift was difficult. Flights into and out of St. Croix were almost entirely made up of previously-dedicated aircraft. In addition, flights arrived, departed, and were diverted with very little or no prior notification, demanding maximum flexibility in departure plans. This uncertainty of transport is not unexpected nor without precedent in contingency operations, but should be minimized where possible. If disaster relief continues to be within the NEHC mission purview, fiscal allowances for the proper and timely execution of that mission should be pursued to ensure services are delivered and terminated in as professional and expeditious a manner as possible.

The MMART system, as currently conceptualized, does not realistically address transportation requirements onsite, relying upon receiving commands to place vehicles at the disposal of the MMART. A concerted effort on the part of both the Team Leader and his deputy failed to produce vehicles from DoD components onsite. Vehicles were finally provided by the Public Health Department 5 days post-arrival only after repeated inquiries by the Team Leader.

C. Recommendation: Unless there are compelling reasons to do otherwise, personnel to be utilized in an MMART vector control mission where on-site assets are minimal should be drawn from the cognizant DVECC. This would simplify transportation requirements. In addition, DVECC personnel are intimately involved with vector control equipment as an integral part of their daily mission and are especially familiar with the operation and maintenance histories of the particular pieces of equipment most likely to be utilized on these deployments. This would avert a great deal of field refamiliarization required by PMTs whose primary duties are normally some other facet of Preventive Medicine.

Means to fund the use of dedicated aircraft when practicable, should be pursued when tasking for deployments within a disaster scenario.

A 3/4-ton truck is currently listed in the Augmented Field Support Module of the Vector Control Block. However, a dedicated MMART transportation asset was not deployed with either team, ostensibly because requesting commands could reasonably be expected to provide the non-entomological resources necessary for mission accomplishment. This has historically been proven to be a false assumption and has led to a great deal of non-productive time spent in procuring vehicular support. Provisions should be

made for acquisition and maintenance of organic vehicle assets for utilization during MMART deployments.

#### 3. EQUIPMENT

A. Problem: Equipment stocks were not configured to provide optimal vector control support.

B. Discussion: The BeecoMist ULV machines performed well in the field, with little maintenance needed for the units themselves. Contamination by pesticide drawn back through the vehicle's airfoil required remedial measures however, including removal of the vehicle's tailgate. This problem could be averted by either providing a larger blower to broadcast the pesticide beyond the backdraw of the airfoil, or lengthening the head support to place the dispersal head above the airfoil. Ironically, while the reduced noise and semi-visible pesticide dispersal characteristics of the BeecoMist XL 10 are generally regarded as two of its best attributes, at St. Croix they were counterproductive. The Crucians were used to noisy, truck-mounted thermal units dispersing a thick fog. Accordingly, public reaction to the BeecoMist was not as positive as anticipated. Newspaper articles explaining the operational characteristics of the electric ULVs did little to allay these misconceptions. In the context of providing tangible relief for one of the numerous inconveniences attendant with Hurricane Hugo, VCT-2's mosquito abatement efforts would have been much better received had either thermal fog or gasoline-powered ULV been used.

The major problem in natural disasters has historically been filth flies breeding in organic debris. Other than two Echo Kioritz backpack units and cans of Fly-Tek, little was available to VCT-2 in the way of fly control assets. Filth fly populations requiring control efforts will almost always require control assets on a large scale. Filth fly problems successfully abated by backpack sprayers are probably not of much import in an epidemiological sense in any case. Additionally, much of the fly control efforts took place in and amongst piles of debris and twisted girders in partially destroyed buildings. Maneuvering with the backpack sprayers in these situations was extremely difficult and, at times, dangerous.

C. Recommendations: If aerial spray is unavailable, the only other option for rapid ULV spraying over large areas lies in the utilization of many different ground units. The current gasoline-powered units are exceptionally heavy and expensive. This makes procurement or deployment of more than one unit difficult. Smaller models of these ULV units could be obtained for half the price of the larger models without sacrificing durability or meaningful performance attributes, e.g.

Leco Model 7000 H/D		\$3475	
Model G-4 Micro-Gen	vs.	1071bs	\$1951

Procurement of 2 Model G-4 Micro-Gens for the price of 1 heavy duty unit would add response flexibility to control strategies in addition to the the "noise" and visibility of dispersal characteristics evidently necessary for public awareness and support. Parts for the pumps and engine components would also be easier to procure than those associated with the BeecoMist. A useful adjunct to ULV would be thermal for capability. Notwithstanding the greater complexity and additional support components required for operation, thermal fogs engender widespread public acceptance and would probably elicit greater cooperation on the part of constituent parties. A handheld Dyna-Fog utilized at Alexander Hamilton airport for fly control at a warehouse brought immediate and enthusiastic support from the DoD components in the area, whereas little attention was paid to operations using backpack sprayers. The St. Croix Public Health Dept. has opted to procure thermal foggers for future operations, primarily on the basis of public acceptibility. Small, skidmounted foggers such as the Model 250 London Fogger (weight-210 lb.s, cost-\$2450, output-25 gals/hr) would be optimal. A mix of 2 small ULVs and 2 small thermal foggers from which to draw resources upon deployment would provide maximum flexibility to tailor control strategies without significantly affecting budget expenditures.

A small, truck-mountable/towable hydraulic sprayer is needed for contingency fly control. The FMC-Bean Model DP 10E/50FRB is a skid/trailer mounted unit with a 50-gallon tank and a 10.5-gal/minute pump. This unit weighs 160 lb.s, occupies 24 cube and costs \$1205. Acquisition of units such as these would fill a glaring gap in our current contingency vector control capability and would have been invaluable in our efforts at fly control on St. Croix.

#### 4. WATER AVAILABILITY

- A. Problem: Means were not available for VCT-2 to cool water for drinking.
- B. Discussion: Several factors contributed to a need to refrigerate water. First, maintenance and repair of equipment used at night and in the morning had to be accomplished during the heat of the day. The daily temperature from 0900-1600 averaged approximately 90°F. All repairs had to be done out in the direct sunlight for lack of alternative venues. All ice available on the island was considered unpotable, therefore water had to be consumed even though very warm, almost hot. This did not encourage proper water discipline. Although other units had refrigeration capability, room for VCT-2's water supplies was simply unavailable.
- C. Recommendations: A small field-refrigerator as specified in the AMAL should be part of <u>all</u> contingency operations field gear. Availability of a means of cooling potable water in a disaster relief scenario cannot be assumed. Its role in encouraging water discipline alone justifies its inclusion in any mountout gear.

#### 5. CONTINUITY OF OPERATIONS

- A. Problem: Suitable means for maintaining a large-scale vector control effort by the St. Croix Public Health Department after departure of VCT-2 were not available.
- B. Discussion: Prior to VCT-2's arrival, the only equipment organic to the Public Health Department (PHD) was an inoperative thermal fogger. Approximately 40 man-hours were spent by VCT-2 in an effort to make the thermal fogger operational-with only partial success. As a result of this shortfall in equipment, the HMS Pest Control Company was contracted as an adjunct to the PHD and VCT-2 for provision of island-wide vector control support. Upon withdrawal of VCT-2s equipment assets, PHD was without sprayers and HMS was to be contracted to fill the gap until equipment backfill through FEMA channels.
- C. Recommendation: The options available for replenishment of disaster relief equipment through FEMA reimbursement should be actively pursued for future deployments. Once logistical avenues are clarified, mechanisms should be set in place to expedite future backfill. Then, equipment could be turned over, if necessary, to constituents upon MMART departure without an interruption in services. This would also provide a means of acquiring new equipment to backfill MMART AMALS.



#### DEPARTMENT OF THE NAVY

NAVY ENVIRONMENTAL AND PREVENTIVE MEDICINE UNIT NO 2 NORFOLK, VIRGINIA 23511-6288

> 6250 Ser 04/1 1 00 08 0 6 NOV 1989

Officer in Charge, Navy Environmental and Preventive

Medicine Unit No. 2. Norfolk

To: Commanding Officer, Navy Environmental Health Center,

2510 Walmer Avenue, Norfolk, VA 23513-2617

Subj: AFTER ACTION REPORT OF VECTOR CONTROL OPERATION AT ST.

CROIX, U. S. VIRGIN ISLANDS

Ref: (a) NAVENVIRHLTHCEN NORFOLK VA 291610Z SEP 89

Encl: (1) After Action Report of Vector Control Operations at

St. Croix. U. S. Virgin Islands, 29 September to

11 October 1989

1. On the morning of 29 September 1989, the Navy Environmental Health Center initiated Vector Control Team 2 for hurricane disaster support to St. Croix, Virgin Islands. Reference (a) soon followed, formally placing this team into action.

- 2. Though reaction to this crisis was rapid, and the overall mission a success, several major areas should be reviewed. This will enhance the future capabilities of Mobile Medical Augmentation Rediness Team, the readiness of each Unit, and the dedicated response of our personnel. The areas under review in enclosure (1) of this report will cover overall authority, transportation arrangements, supply replenishment, field operations, and departing procedures.
- 3. All members of the team effort deserve the highest praise. and hopefully will be properly recognized by higher authority in the near future.

W. M. BUTLER

Copy to: USUHS Preventive Medicine (CAPT Sholdt) NAVDISVECTECOLCONCEN Jacksonville DPMIAC (CDR Tresper)

- After Action Report of Vector Control Operations at St. Croix, Virgin Islands, 29 September to 11 October, 1989
- Ref: (a) Logbook Vector Control Team 2
  - (b) Phoncon btwn CDR Zimmerman, DVECC JAX / LCDR Stevenson. NEPMU-2 Norfolk on 19 Oct 1989
- Atch: (1) Article from St. Croix Avis, Oct. 3, 1989, Mosquito spraying this week
  - (2) Article from Federal / Territorial Coordinating
    Office, Oct. 6, 1989, Navy says residents can play
    big part in helping eliminate mosquito problem
  - (3) Report of the U.S. Navy Vector Control Team, St. Croix, Sept. Oct., 1989 (Initial report to Commissioner of Health, U.S. Virgin Islands)

#### I. Overall Authority

- A. <u>Findings</u>. There was some confusion about who actually was in charge of Vector Control Team 2. The Team Leader and two PMT's were from NEPMU-2, Norfolk, while two additional personnel and supplies were from DVECC, Jacksonville. The question arose concerning who this team was suppose to report to for additional guidance and direction.
- B. Recommendations. Since both of the above mentioned commands are governed by NEHC, then this echelon 3 command should be relied upon in all aspects of guidance and direction. NEHC should in turn delegate authority to the respective commands to insure mission accomplishment. Likewise, reports, mission changes, or other similar requirements should be routed through NEHC first. In the event that BUMED had directed the organization of a preventive medicine or vector control team, then guidance and direction would be expected to remain within BUMED.

#### II. Transportation arrangements

#### A. Findings.

- 1. Confusion occurred at the beginning when military flights were being investigated for transporting the personnel and supplies into St. Croix. NEPMU-2 was contacted by various airlift schedulers, even though NEHC was involved in making the contacts and arranging the flights. Cargo cubic footage and weights were changed several times, which added to the confusion.
- 2. Administrative details, such as orders and return commercial tickets, were made satisfactorily. SATO supplied good support in providing quick response to our needs.

مهر معرسهار فنديت والمستمد والرابي والرواوي المراز والمستمد الراز فالراز والمراوي

#### B. Recommendations.

- l. Future planning should make one command solely responsible for requesting and scheduling military transportation. Preferably one or two points of contact should initiate and follow the sequence to its completion as was done in the St. Croix effort. However, all incoming questions and informational requests from the airlift contacts should be referred back to the command in charge of this matter. Cargo cubic footage and weights should not be given until all supplies have been included.
- 2. All available transportation options should be investigated, i.e. commercial movement of all personnel from NEPMU-2 to Jacksonville, then to St. Croix, or immediate movement of the team leader to St. Croix while other personnel are sent to Jacksonville.

#### III. Supply replenishment.

- A. <u>Findings</u>. The one re-supply effort to St. Croix was unsuccessful. Hand compressed sprayers are still lost in shipment, possibly being held in a warehouse at Roosevelt Roads Naval Station. From calculating the usage rates at St. Croix, some replenishment would have been necessary had the team stayed another two weeks.
- B. Recommendations. The best replenishment is done with military flights that depart from the point of origin and arrive at the final destination, with no stops in between and no changes of aircraft. This is the best situation and should be strived for in all situations. If less than desirable flights must be used, other measures to insure a successful replenishment would be to establish a "permanent" point of contact at the final, or even temporary, destination. By "permanent" we mean someone who is stationed at the site, knowledgeable about the base, and can find the incoming supplies regardless of when they arrive. If the supplies arrive at a temporary site, this point of contact would be available to help move the supplies along.

#### IV. Field operations.

#### A. Findings.

1. Reference (a) notes the high points of getting established, formulating a plan of action, and overcoming the obstacles that occurred. Some of the major obstacles were: unjustified fears from high ranking officials about mosquito fogging, apparent lack of initiative from the local populace, lack of suitable wash down/maintenance facilities for equipment, need for large scale control equipment, and lack of vehicular support for control operations.

فالمعا فعارفونيه الماء والماء والماء وأفوار العربية المتعاصين والماء المعتبين والرابات

- a. 'Unjustified fears' about mosquito fogging occurred almost instantly. It later appeared to be a misunderstanding about aerial verses ground applications, but it was unjustified nonetheless. Measures to combat this, even before it happened, were attempted through a newspaper article [attachment (1)].
- b. 'Lack of initiative' may in part have been the result of shock from the hurricane. There was also little prior planning for this disaster, which created a lot of initial confusion, changing priorities, and redirected work efforts. In actuality, some personnel had in fact been at work every day for two to three weeks straight, with little attention to their own families and residences. However, regardless of the reason, drivers to assist us in mosquito fogging would sometimes be absent, and plans had to change accordingly. In addition, the control of Aedes aegypt' was desired by all, but residents needed to take care of breeding sites on their own property. Attachment (2) was submitted to the local newspaper to hopefully direct some attention in this area. Attachment (3) was submitted by the team leader to various government officials to recommend self sufficient capabilities.
- c. The 'lack of suitable washdown or maintenance facilities' was due to the shortage of power and water on the island. The only operable hospital, under emergency power, turned out to be the best place for washing. Public Works had a garage, but the tools belonged to the individual workers, who took their tools home with them. This relates somewhat to the above paragraph. Work on the local fogger had to be scheduled based of when the shop was being manned.
- d. 'Large scale control equipment' became an obvious need when filth fly breeding sites began growing and fly control became less and less successful. Attachment (4) shows the size and complexity of St. Croix, and justifies the use of a buffalo turbine or a hydraulic sprayer.
- e. 'Lack of vehicular support' was one of the main obstacles to overcome. The Army was the most likely source of assistance, but very few half ton trucks were available. The local public health department was able to provide three trucks, which were used throughout the operation, and could also have been used when their own foggers came in.
- 2. The team leader's past experience at St. Croix, though a brief one, was very helpful in making inroads and establishing contacts for Vector Control Team 2.

#### B. Recommendations.

- 1. Communication through personal contact, media, and official meetings is mandatory to belay fears so commonly seen in any control work. The team leader should give priority to this effort immediately upon arrival. Using the type of equipment that is familiar to the populace is also a consideration in stopping fears and fostering an attitude of well being. For instance, the large and noisy LECO and LONDON AIRE ULV units may have been better received instead of the Whispermist 'stealth' foggers.
- 2. Navy entomologists should consider including a buffalo turbine or hydraulic sprayer into the MMART equipment list. A <u>military</u> operation may not include such a wide area of control as what this team was responsible for, but future disaster assistance operations could have a similar scenario, whereas larger equipment would be needed.
- 3. There is no substitute for having someone with prior knowledge of an operational area. This was very helpful and should always be considered in choosing a team.

#### V. Departing procedures

- A. <u>Findings</u>. Fortunately, there were a number of incoming flights each day to St. Croix, both commercial and military, which made getting a cargo flight fairly easy. Communications were very poor, however, and incoming flights were not known about very far in advance. Erroneous information was also frequently encountered in St. Croix concerning incoming military flights, making it difficult to plan and organize. After getting into the states, out-dated commercial tickets were turned into the airline's ticket counter and new ones issued with no problem.
- B. Recommendations Opportune lift flights are sometimes difficult to obtain. An option should be the use of commercial resources, if available.

#### VI. Summary

A. Past training exercises were very useful in making this operation a success. It was a difficult maneuver, involving three commands, two separate departure sites, and an overseas destination ravaged by a hurricane. All involved parties worked together and made the mission work. As discussed in reference (b), DVECC Jacksonville is conducting a similar review in areas pertaining to their responsibilities. Their insights would also be helpful in preparation for future operations.

#### Report of the U.S. Navy Vector Control Team. St. Croix. Sept. - Oct., 1989

#### I. INTRODUCTION

The U.S. Navy Vector Control Team was mobilized by the Navy Environmental Health Center to provide disease vector control to the residents of St. Croix. This objective was accomplished in a three-fold plan:

- l) By working in cooperation with the St. Croix Public Health Department, providing immediate services in the area of control equipment, supplies, and additional qualified personnel.
- 2) Training additional personnel to work with the St. Croix Public Health Department in order to continue vector and pest control operations in the future.
- 3) Pinpointing potential problem areas requiring continual or long term corrective actions.

Mosquitoes and filth flies are the primary concerns at this time for the Public Health Department personnel involved in vector control. Detailed information on these subjects is found in Sections II. and III. below.

Feral dogs are a minor concern at present, but a potential public health threat that should be monitored. Section IV. below provides information on this subject.

#### II. MOSQUITOES

#### A. Salt marsh mosquitoes

- l. The most common and annoying mosquito is the salt marsh species, <u>Aedes taeniorhynchus</u>. It breeds in brackish and salt water, and consequently is most common along the coast. However, this mosquito is a very strong flier and can easily gain access to almost any part of the island.
- 2. Biting counts recorded before fogging operations commenced averaged 2 bites/man/minute, beginning at 1800 hours, peaking at 1830, and decreasing between 1900-2100 hours depending on mosquito population density, wind direction, and wind speeds. According to informal interviews with local residents, these counts are apparently more severe than before Hurricane Hugo.
- 3. However, surveillance for larval habitats of the salt marsh mosquito indicate reduced breeding sources in size and number. Possible breeding was occurring near the race track. Debris accumulation in this area showed that the water level had

moved inland to low lying ground south of the race track during the hurricane, but had generally dissipated since that time. This was supported by information from the U.S. Department of the Interior, which reported that the storm tide surge on the north side of the island was 4.5 feet above sea level, and the south side of the island was 6.5 feet above sea level. From our surveillance, the habitats created by this storm surge have largely disappeared, either having dried up or having been absorbed into the soil.

4. Although a fierce and painful biter, the salt marsh mosquito is of  $\underline{no}$  consequence regarding disease transmission on St. Croix.

#### B. Dengue mosquitoes

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- l. The most important mosquito on the island is <u>Aedes aegypti</u>, the Dengue mosquito. It is also commonly called the Yellow Fever mosquito because of its active role in spreading this disease throughout a large part of the world. Fortunately, Yellow Fever is not present on St. Croix. However, Dengue, a viral disease, has been reported and confirmed. The <u>Aedes aegypti</u> is particularly insidious in that it bites during the day and readily enters homes, breeding inside when containers with fresh water are found. It also will rest quietly in undisturbed, cool, dark areas of the home. As a pest it is hardly ever considered a fierce or aggressive biter, preferring more stealth-like and unobtrusive attacks about the ankles that many times go without notice.
- 2. Tables 1 and 2 show the degree of Dengue mosquito infestation levels within randomly chosen areas of Christiansted and private residences. The Dengue mosquito populations are quickly approaching, or have already reached, suitable densities to allow rapid transmission of the virus. Part of this can be attributed to the hurricane, resulting in broken or intentionally opened cisterns, and extraordinary amounts of water-holding debris. Nevertheless, the extent and spread of the infestation indicates high Dengue mosquito populations already existed before the hurricane. The problem can be expected to get worse, unless corrective actions are taken.
- 3. Some degree of control is achieved through the regular use of truck mounted ground fogging against adult mosquitoes. The amount of control inside houses fluctuates with the distance from the road, the structure of the house, and prevailing winds. Because of the Dengue mosquito's resting behavior, it is many times in protected areas of the house where outdoor fogging cannot reach. Individual, indoor fogging of houses and buildings provides excellent temporary control of Dengue mosquitoes, but this is very labor intensive and generally not considered, unless an epidemic is eminent.
- 4. Therefore, it is generally not feasible to staff a public health department so thoroughly as to be capable of

satisfactorily combating the Dengue mosquito. Instead, control is most successful through educating the populace. This can be done through newspaper and radio media, educating the school teachers for dissemination to their students, and through the use of information pamphlets. Many residents are probably not aware of Dengue mosquitoes within their homes. With the introduction of the Dengue virus into a neighborhood, this disease vectoring mosquito could successfully spread the virus quickly throughout the area. In such an instance, Dengue cases would be occurring before any control measures could be initiated to stop the spread. For this reason preventive control is important and must be continually stressed.

#### C. Present resources for mosquito control on island

- l. One thermal fogger, repaired by HMCS Roden, HM1 Pressley, and HM1 Cardwell, is available for use by the Public Health Department of St. Croix. Our remaining ULV malathion has been properly diluted and set up for use with the thermal fogger. Three other foggers are available for use through HMS Pest Control, William S. Skinner, President; P.O. Box 159, Christiansted, St. Croix, U.S.V.I. 00820; PH: (803) 773-6355. Presently, a contract has been established with this company to provide services to the island. LCDR Stevenson and LT Conlon reviewed the fogging plan and examined the foggers. In our opinion, the management is competent and knowledgeable in mosquito fogging strategies.
- 2. Only a small amount of Abate granules is available for larviciding purposes. See Section V. for the additional supplies provided by our team.

#### D. Recommendations

- 1. If the Public Health Department is going to be involved in mosquito fogging, then at least two additional technicians should be hired.
- 2. The present thermal fogger has been unreliable in its operation. Therefore, a new, nonthermal fogger is recommended. The closest distributor for either thermal or non-thermal equipment, and suitable fogging insecticide, is Adapco, Inc., Al Woolridge, P.O. Box 547218, Orlando, FL 32854-7218; PH: (407) 291-7960. Telex: 514550 TATS ORL.
- 3. Until such time as Public Health personnel are hired and a vector control program is established, St. Croix should continue the contracted services of HMS Pest Control possibly through December. This would also provide a margin of safety through the rainy season while clean up and repair operations continue on the island. Hopefully, much of the artificial containers so successful for Dengue mosquito breeding will be eliminated by this time.

Contract to the second

4. Fogging should be come every three days to each area requiring it. The main areas of concern are urban centers and congested residential places. Continual togging does not substantially reduce mosquito densities below that achieved by rotational programs, and is substantially more labor and money intensive.

#### III. FILTH FLIES

#### A. Findings

1. The four major dumps designated by FEMA, and randomly scattered temporary sites, are the main sources of concern for filth fly breeding. Adult flies are numerous in these areas, ranging from 10 to 20 adult flies per square foot. Soil coverage is minimal, allowing some garbage to be exposed.

S. One destroyed werehouse at the airport is of particular concern, since much of the food is damaged and beginning to decompose. This area has been treated several times by the Nayy Vector Control Team, but the control efforts are temporary at best.

#### Recommendations

1. In order for chemical control to be successful, a large scale control capability is needed. A buffalo turbine or hydraulic sprayer is best suited for such purposes. Used regularly, adequate pesticides could be dispersed to hold in check filth fly breeding. The buffalo turbine is sold by MY 10470: PH: (716) 532-2372. A hydraulic sprayer commonly used by the military is from FMC Corp., John Bean Div., 516 Dearborn by the military is from FMC Corp., John Bean Div., 516 Dearborn Street, Tipton, TW 46072. Perticides can be ordered through the same company mentioned in II. D. 2. above.

A. Burning of brach is highly recommended as a means of reducing fly breeding. Specific, official burn sites should be established and then monitored by the Fire Department. This would prevent any mishaps, but would allow quick and safe elimination of excess debris and food wastes.

#### IA. FERAL DOGS

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#### A. Findings

1. Stray dogs have been commonly seen at the dump near the airport, as well as at trash sites along the sides of little traveled roads. These dogs have sometimes been seen in small packs, and in relatively isolated areas, suggesting something more than just free roaming dogs.

2. Rabies supposedly do not exist on St. Croix. Notwithstanding this disease factor, some danger exists from dog attacks to people working around the dumps, and to a lesser degree the destruction of poultry or other livestock.

#### B. Recommendations

1. The Public Health Department should visually inspect for feral dog population increases. In the event a control program must be started in short notice, different control strategies should be investigated and the appropriate approval obtained now.

#### V. SUPPLIES PROVIDED

- A. The following supplies for vector control on the island are being provided to the St. Croix Public Health Department primarily from the Disease Vector Ecology and Control Center, Jacksonville, FL.
  - 1. Malathion ULV, 96% 45 gallons
  - 2. Dursban 4E 8.5 gallons
  - 3. Dursban 1.5 ULV 9.3 gallons
  - 4. Fly-Tek Fly Bait 7 pounds
  - 5. Warfarin 9 pounds
  - 6. Rozal Tracking Powder 5 pounds
  - 7. D-phenothrin aerosol 21 cans
  - 8. RID louse spray 6 cans
  - 9. Maki 27 pounds
  - 10. Ficam W 55 packets

#### VI. REFERENCES

#### A. Navy Environmental Health Center. Norfolk, VA

- 1. The decisions and support for preventive medicine in the U.S. Navy is the responsibility of the Navy Environmental Health Center, Norfolk, VA 23511.
- 2. This command arranged and sent the Vector Control Team to St. Croix, having charge over both the organizations which made up the team, as follows:

#### B. Disease Vector Ecology and Control Center, Jacksonville

- 1. LT Joseph M. Conlon and HMCS Kenneth L. Roden composed two of the team members. They are assigned to the Navy Disease Vector Ecology and Control Center, Box 43, NAS, Jacksonville, FL 32212; PH: (904) 772-2424.
- 2. This Center is composed of primarily entomologists, and may be able to assist you with equipment repair, calibration, or other technical assistance in the future.

#### C. Environmental Preventive Medicine Unit Two, Norfolk

1. LCDR H. Robert Stevenson, HM1 Eric M. Presslev, and HM1: Avelino M. Cardwell made up the other three members of the Vector Control Team. They are assigned to the Navy Environmental Preventive Medicine Unit No. 2, Norfolk, VA 23511-6288; PH: (804) 444-7671.

#### D. U.S. Army

- 1. PFC Jan Halladay of the Virgin Island National Guard has been given training in mosquito fogging, fly control. and Aedes aegypti surveillance. She has made a worthwhile contribution to this teams' work, and can be further utilized in preventive medicine responsibilites for St. Croix.
- 2. SSG Harold and PVT Lowe are Preventive Medicine Technicians with the 18th Airborne. They have also assisted our team. PVT Lowe worked with us in conducting fly control. mosquito larvae surveys, and a rodent survey.

#### E. Personnel contacted

- MG Moorehead, Commander, Virgin Islands National Guard
- 2. COL Sefton, Asst. Adjutant General, Alabama National Guard
- 3. CAPT Headley, USPHS, NIH, Bethesda, MD
- 4. CAPT Sass, USPHS, NIH, Bethesda, MD
- 5. CDR Grey, USPHS, NIH, Bethesda, MD
- 6. CDR Spicer, Representative to Commander, Naval Activities. Carribean
- 7. CDR Sullivan, USPHS, NIH, Bethesda, MD
- 8. CDR Tonat, USPHS, NIH, Bethesda, MD
- 9. LCDR Glover, USPHS, FDA, Washington, DC
- 10. MAJ Walters, Environmental Sciences, 18th Airborne
- 11. MAJ Sellers, Executive Off., Alabama National Guard
- 12. MAJ Lyda, Operations Off., Alabama National Guard
- 13. LT Rhodeman, Medical Off., USNH, Roosevelt Rds
- 14. SSG Harold, PMT, 18th Airborne
- 15. PFC Halladay, PMT, V.I. National Guard
- 16. PVT Lowe. PMT, 18th Airborne
- 17. Dr. Heath, Commissioner of Health, Virgin Islands
- 18. Dr. Green, Deputy Commissioner of Health, Virgin Islands
- 19. Dr. Lewis, Public Health Director, St. Croix
- 20. Mr. Gill, Environmental Health Dept., St. Croix
- 21. Mr. Williams, Vector Control, St. Croix
- 22. Mr. Jackson, Personnel Director, St. Croix
- 23. Mr. Quinones, FEMA Public Information Office
- 24. Mr. Sydel, FEMA Accounting
- 25. Ms. Hines, VITEMA Public Information Office
- 26. Mr. Skinner, Pres., HMS Pest Control, St. Croix
- 27. Mr. Sullivan, HMS Pest Control, St. Croix

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# The St. Craix Auis

THE ONLY LOCALLY OWNED NEWSPAPER SERVING THE VIRGIN ISLANDS SINCE 1844

ST. CROIX, U.S. VIRGIN ISLANDS

THESDAY OCTOBER 3, 1989

No. 235

Free

# POWER BY SPRING

## Mosquito spraying this week

FEMA Public Information Writer

Almost everyone on St. Crotx has felt the bile of a few of the millions of mosquitos that have been thriving here ever since Hugo struck. But now, Crucians can look forward to revenige as well as relief.

The U.S., Navy this week is scheduled to begin spraying the whining, bloodthirsty insects with chemicals that knock them right out of the air.

We are going to spray from the backs of trucks," said Lt. Commander Rob Stevensen. The spray comes out of a small machine in the form of a log."

Lt. Commander Stevensen said the logging trucks would be visiting residential areas of the island twice a week for at least the next several weeks. Residents will see the vehicles at betwen 5:00 a.m. and 7:00 a.m. and between 6:00 p.m. and 9:00 p.m.

"Those are the hours that the mosquitos are out and flying" Lt. Commander Stevenson said. "The chemicals affect them while they re in the air."

air.
Commander Stevensen said the two chemicals being used are called Malathion and Dursban, and that the health risks associated with proper use of them are small.

This is a concentrated inserticide, and we're only putting out about one and one-half ounces per acre," he said.

He said, "The chemical particles are very small.

and they are effective only while they are in the air. It settles in a few hours, and once it lands, it breaks down quckly.'

"The health risk is negligible," Lt. Commander Stevenson said.

He said that although the chemicals have a distinctive odor, people living in the areas being sprayed do not need to take any special precautions when they smell it or when they see the fogging trucks.

But he said that people in cars or on bicycles should not follow closely behind the fogging trucks.

"A person breathing it for a long period of time might get a severe headache," Lt. Commander Stevensen explained.



## FEDERAL/TERRITORIAL COORDINATING OFFICE



### **NEWS RELEASE**

FEMA-841-DR-VI-09 Oct. 6. 1989

DISASTER INFORMATION FROM: JOINT INFORMATION CENTER Company Street, Christiansted, U.S. Virgin Islands

MEDIA CONTACTS: FEMA: Phil Cogan, Paul Guernsey
Terr. of V.I.: Claudette Young-Hinds.
(Other agency contacts are listed.)

### NAVY SAY RESIDENTS CAN PLAY BIG PART IN HELPING ELIMINATE MOSQUITO PROBLEM

The U.S. Navy says St. Croix residents can play a large part in helping to eliminate the current mosquito problem.

Navy Lt. Commander Rob Stevenson said it was especially important that the island's mosquito population be reduced, because some types of mosquitos living here are known to cause serious illness. Those illnesses include dengue fever and vellow fever.

It is important that the residents themselves take appropriate actions to eliminate all mosquito breeding places," said Commander Stevenson.

He explained, "These mosquitos breed in man-made containers such as open cisterns, tires, cans, and other objects that catch and hold fresh water."

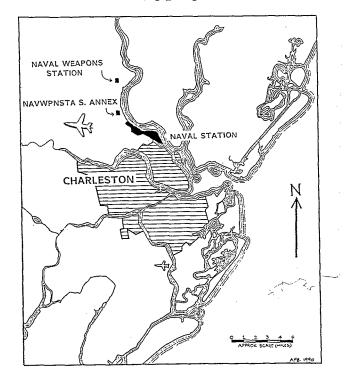
Commander Stevenson said, "Insecticide usage is only temporary and partly effective. As many of these containers as possible must be emptied of water and covered so that they do not continue to collect water.

"Such a job is too extensive for any government agency," he said.

Commander Stevenson said Crucians could help the health risk by sealing open or damaged cisterns, emptying buckets and barrels, removing discarded cans and bottles from residential areas, and pouring the water from any container such as empty refrigerator trays and flower pots.

(Source: U.S. Navy / St. Croix)

# VECTOR CONTROL ACTIVITIES OF VCT-3



CHARLESTON, SC



#### DEPARTMENT OF THE NAVY

## NAVY DISEASE VECTOR ECOLOGY AND CONTROL CENTER NAVAL AIR STATION JACKSONVILLE, FLORIDA 32212-0043

6440 00/930604 3 NOV 1989

FIRST ENDORSEMENT on Team Leader (VCT-THREE) 1tr 6440 04/930603 of 2 Nov 89

From: Officer in Charge, Navy Disease Vector Ecology and Control

Center, Jacksonville

To: Commanding Officer, Navy Environmental Health Center

Subj: DISASTER RELIEF FOR VECTOR CONTROL TO CHARLESTON NAVAL

WEAPONS STATION FOLLOWING HURRICANE HUGO

#### 1. Forwarded.

2. My congratulations have gone out to Vector Control Team Three (VCT-THREE) for their outstanding efforts in the wake of Hurricane Hugo. From their efforts we have gained invaluable experience and knowledge.

Copy to:

Team Leader LT D. M. Claborn, MSC, USNR



#### DEPARTMENT OF THE NAVY

NAVY DISEASE VECTOR ECOLOGY AND CONTROL CENTER NAVAL AIR STATION JACKSONVILLE, FLORIDA 32212-0043

> 6440 0411/930603 2 Nov 89

From:

Team Leader, Vector Control Team Three (VCT-THREE)

To:

Commanding Officer, Navy Environmental Health Center

Via:

Officer in Charge, Navy Disease Vector Ecology and Control

Center, Jacksonville

Subj:

DISASTER RELIEF FOR VECTOR CONTROL TO CHARLESTON NAVAL

WEAPONS STATION FOLLOWING HURRICANE HUGO

Encl:

(1) Copy of LT Cope NAVDISVECTECOLCONCEN JAX memo of 28 Sep 89 to OIC NAVDISVECTECOLCONCEN JAX

(2) Copy of Asst. Ops. Officer NAVDISVECTECOLCONCEN JAX

memo of 10 Oct 89 to OIC NAVDISVECTECOLCONCEN JAX (3) Copy of CO NAVHOSP Chas SC 1tr 6250 310.3/47 of 4 Oct 89

to OIC NAVDISVECTECOLCONCEN JAX

#### Background

- a. Hurricane Hugo struck Charleston, South Carolina, on 21 September causing widespread damage to buildings and other structures. Power, communication, and transportation were disrupted by flooding and fallen trees over a wide area. Many areas were without power four weeks after the storm. Several low-lying areas remained flooded weeks after the hurricane, and fallen trees prevented access for normal mosquito larviciding activities. Concurrent with the destruction of Hurricane Hugo, an epidemic of Eastern Equine Encephalitis was also noted in horse populations along the eastern coast of the United States. At least one human case was also noted. These situations caused great concern for the health of military and civilian personnel in the Charleston area.
- b. Due to the complete destruction of the communication systems in the Charleston area, a preliminary visit was made to the Charleston area by LT S. E. Cope, MSC, USNR, of the Navy Disease Vector Ecology and Control Center (DVECC) Jacksonville. His objective was to establish contact with Preventive Medicine at the Naval Station Charleston and with the Mosquito Abatement District in Charleston County. His findings are reported in enclosure (1).
- c. A subsequent fact-finding trip was undertaken by LT Cope and LT D. M. Claborn, MSC, USNR, 3-5 October 1989 to assess the effect of Hurricane Hugo on vector populations (enclosure (2)). This trip revealed high levels of mosquito infestations on the Naval Weapons Station, Charleston. Species which were collected included Aedes sollicitans, Ae. vexans, Ae. taeniorhynchus, Psorophora columbiae, and Ps. ferox. Landing rates in some areas were in excess of 75 mosquitoes/minute, mostly Ae. sollicitans. Larval counts in some swamps were between 6 and 10 mosquitoes/dip. Even shipboard personnel at the Naval Weapons Station piers were being bitten while on the mess decks.

- d. In response to a request for assistance from the Commanding Officer, Naval Hospital, Charleston (enclosure (1)), a vector control team consisting of one entomologist and one preventive medicine technician was deployed, along with a Buffalo Turbine, to the Charleston Naval Weapons Station. The intended objectives of this team were to
- (1) effect mosquito control by application of residual pesticide to fallen brush and vegetation which were providing protection for large vector populations;
  - (2) effect larval control in low-lying flooded areas;
- (3) monitor the effectiveness of vector control efforts by station pest control, DVECC personnel, and the Air Force C-130 spray team;
- (4) train local pest controllers in the maintenance and safe use of the Buffalo Turbine so that brush treatment could be continued after DVECC personnel returned to Jacksonville.

#### 2. Personnel Contacted

RADM S. Bump Commanding Officer NAVSTACHRS CAPT R. White Chief of Staff, NAVSTACHRS CAPT R. Kmetz CO, Naval Weapons Station, Charleston PWO, Naval Weapons Station, Charleston CDR R. Johnson LCDR R. Williams Head, Preventive Medicine, NAVMEDCLNCHRS Maj D. Deckman Spray Mission Commander, USAF Maj L. O'Dell Navigator, USAF Maj T. Biery Entomologist, USAF Capt G. Lucas Pilot, USAF Capt D. Wiles Navigator, USAF Public Affairs Officer, WPNSTA, Chas. LT C. McNew LT L. Lindsey Assistant PWO, WPNSTA Chas. ENS J. Bobich EHO, NAVMEDCLNCHRS PM, Chief, NAVMEDCLNCHRS HMC C. McDowell MSgt W. Rooks Loadmaster, Spray System Operator, USAF TSgt R. Jamison Loadmaster, Spray System Operator, USAF Flight Engineer, USAF TSgt G. Cary PMT, NAVMEDCLNCHRS HM1 R. Larsen Entomologist, NAVFACENGCOM Pest Control Leader, NAVSTACHRS Mr. C. Bennett Mr. C. Ducker Work Director, Pest Control, WPNSTA Chas. Mr. C. Gruver PCO, NWSCHRS Mr. R. Braddock PCO, NWSCHRS Mr. R. Graham Mr. L. Seymour PCO, NWSCHRS Mr. M. Hyatt Director, Charleston County Mosquito Abatement

#### 3. Initial Actions

a. On 8 October 1989, the vector control team consisting of LT D. M. Claborn and HM1 D. M. Spafford, USN, arrived at the Naval Weapons Station, Charleston, with the Buffalo Turbine and

10 gallons of Dursban 4E. Billeting was obtained at the Naval Base in North Charleston and the nearby Naval Hospital.

- b. A meeting was held on 8 October at 1530 between activity personnel (including the CO), the Air Force C-130 Spray Team, and DVMCC personnel. Plans were formulated for aerial treatment of the base by the Air Force using Dibrom at 0.5 ounces/acre dispersed at an elevation of approximately 150 feet.
- c. Notices were sent out in the Plan of the Day notifying base personnel and residents to stay away from brush piles where mosquitoes were harbored and where a residual pesticide would be sprayed by DVECC personnel.
- d. Initial landing rates were taken at the spoils site and the ball park. All landing rates were taken on two different personnel and are reported as a mean in Table 1. Monitoring was continued after mosquito control efforts by Public Works, DVECC personnel, and the Air Force. The landing rates were taken at approximately the same time each day for each site, though temperatures varied significantly.

#### 4. Mosquito Control Efforts

- a. Control efforts by DVECC personnel were initiated on Monday 9 October using the Buffalo Turbine. A 0.5% solution of Dursban 4E was applied to felled brush, standing vegetation, and larval breeding sites. Treated areas had previously been identified as "hot spots" by landing rates. These areas included the spoils area and surrounding swamps, the ball park/helicopter pad, the areas around parking lots near the piers, vegetation along Perimeter road, and the ordinance areas. A total of 500 gallons of Dursban mixture was sprayed in these areas. The spoils area and parking lots were each treated twice.
- b. A residual treatment of Sevin S was applied to brush surrounding warehouses in the ordinance areas. Personnel in the warehouses had submitted several complaints about mosquitoes so over 100 gallons of mixed Sevin were applied in these areas. This compound was not used for larviciding.
- c. The Hunley Park residential area was surveyed to determine if mosquito control with the Buffalo Turbine would be effective. However, due to the site of this area (directly above a large marsh) and to the fact that most of the broken limbs had already been removed, it was determined that this type of control would be minimally effective. Aerial treatment by the Charleston County Mosquito Abatement District was recommended and was accomplished later the same day. Periodic treatment by ground ULV was also continued by the activity's pest control personnel.
- d. The South Annex of the Naval Weapons Station was surveyed also. Numerous complaints about mosquitoes had been received from civilian personnel working in warehouses. Heavy brush and felled trees were providing shelter for relatively heavy

populations of Ae. taeniorhynchus. Recommendations were made to the pest control personnel to put a barrier treatment around each of the warehouses using Sevin S applied directly to the vegetation. With this purpose in mind, the Buffalo Turbine was loaned to the Naval Weapons Station. Current ground ULV efforts were also continued.

#### 5. Results

a. Mosquito populations were reduced through efforts of the Air Force, activity pest controllers, and DVECC personnel (See Table 1). Landing rate determinations were continued after DVECC personnel left Charleston by ENS Bobich of Preventive Medicine. NAVMEDCLCHRS and his results are reported in Table 2. A CO2 trap was used for only one night due to the nonavailability of dry ice locally. The trap was baited on the afternoon of the 9th, immediately after the Air Force spray mission. A total of 998 mosquitoes was trapped, mostly Culex spp., but including significant numbers of Ae. sollicitans. In general, landing rates indicated a significant decrease in mosquito activity in all treated areas. Area residents who were queried responded that they were not being bothered as much. Adult mosquito activity and larval populations were drastically reduced in the spoils area where dipping had previously yielded 6 to 10 larvae per dip. After treatment, less that one larva/dip was collected. High levels of adult mosquito activity were still noted near the ball park and in the ordinance areas; activity pest control personnel, however, were properly equipped to handle the problem.

b. <u>Table 1.</u> Mosquito landing rates/minute at Naval Weapons Station, <u>Charleston</u>, following Hurricane Hugo as determined by DVECC personnel.

Date	Spoils 1	Spoils 2	Ballpark
04 Oct 08 Oct <sup>1</sup> , <sup>2</sup> 09 Oct <sup>2</sup> 10 Oct <sup>2</sup> 11 Oct <sup>2</sup>	75	-	_
08 Oct <sup>1,2</sup>	14	-	80
09 Oct2	25	71	71
$10 \text{ Oct}^2$	02	06	22
$11 \text{ Oct}^2$	03	05	25

Date of Air Force Spray Mission

Dates of mosquito control efforts by DVECC personnel

Table 2. Mosquito landing rates/minute at Naval Weapons

Station, Charleston, during control efforts following Hurricane Hugo as determined by Preventive Medicine, Charleston.

Date	Ball Park	A&E Club	Exchange	Main Gate
12 Oct	23	17	05	04
13 Oct	18	21	06	07
14 Oct	19	15	08	03

#### 6. Outbriefing

- a. An out-briefing was held with LCDR Williams, LT Lindsey, and Mr. Bennett on 15 October. LCDR Williams agreed to continue mosquito surveillance by landing rate after DVECC personnel returned to Jacksonville. The possibility of a second treatment by the Air Force was discussed. LCDR Williams assumed responsibility for determining the need for the second treatment.
- b. Pest control at the Weapons Station was advised to include larviciding as part of their mosquito abatement strategy. especially in the ordinance areas where Altosid<sup>R</sup> briquettes or pyrethrum Toss-its<sup>R</sup> would be appropriate. Mr. Bennett concurred on all of these recommendations.

#### Findings and Recommendations

- a. Future deployments in security sensitive areas such as a weapons station can be expedited by obtaining passes to as many areas as possible upon arrival. The local Public Works Officer can contact security to insure the procurement of passes, thereby minimizing the time spent waiting for clearance to areas which need treatment.
- b. Any vector control team should be comprised of enough people and vehicles to adequately accomplish pest control and the accompanying management and planning. In this case, extra personnel and vehicles were not available due to the deployment of two MMART teams to St. Croix and Puerto Rico from DVECC, Jacksonville. The lack of manpower and transportation unavoidably resulted in inefficient use of personnel and less than optimal planning. A designated manager could have identified "hot spots," planned spray routes, monitored effectiveness of control efforts, and acted as liaison with base security and management. A good general guideline would be to always deploy the number of personnel and vehicles necessary to operate the desired number of sprayers, misters, etc., plus one person and one vehicle designated to handle planning and administration.
- c. The Buffalo Turbine, though old, was an extremely useful piece of equipment and was probably the most effective means

available for applying residual pesticides to the large brush piles present after the hurricane. The high pressure (175 mph at the nozzle) and large carrying capacity allowed the vector control team to thoroughly treat thick vegetation which would be relatively inaccessible to ground or aerial ULV technology. In addition, the Buffalo was used to apply larvicides, both granular and liquid, over large areas. The only problems with the use of the Buffalo Turbine were due to its large size and weight. Some areas of the station were inaccessible for treatment because suitable roads were not available. Nevertheless, the Buffalo Turbine is more powerful and more versatile than most pieces of pest control equipment currently in the Navy inventory. It can also be modified with a reel of hose and a pistol-grip spray gun for application in small, inaccessible areas such as building interiors. This would have been helpful in Charleston. The results of the Charleston mission clearly indicate that the Buffalo Turbine enhances DVECC's ability to respond to a variety of situations; therefore, it should be retained in the inventory and constantly maintained for emergency use.

D. M. Clabon

D. M. CLABORN

### MEMORANDUM

From: LT Cope To: OIC

Subj: POST-HUGO TRIP TO CHARLESTON

- 1. On 26-27 September 1989, LT Stanton E. Cope, MSC, USNR, went to Charleston, S.C. to contact vector control personnel and coordinate post-hurricane vector control preparedness among Charleston Mosquito Control, Preventive Medicine, Public Works and the Commanding Officer's office.
- 2. The following personnel were contacted:

RADM Stanley Bump CAPT R. White LCDR R. W. Williams LT K. Ahlin Chief McDowell HM1 R. Larsen Mr. Martin Hyatt Commanding Officer, NAVSTA Chief of Staff Head, Preventive Medicine Flight LT for RADM Bump PM Chief PMT Director, Charleston County Mosquito Control

### 3. Findings

- a. Aerial and ground control equipment of Charleston County Mosquito Control (CCMC) is intact. Mr. Hyatt has one aircraft of his own and has made arrangements to secure aircraft from Savannah and Beaufort, SC. He has also made contact regarding the Air Force spray capabilities.
- b. CCMC has approximately 8000 gallons of malathion which DVECC may use if necessary.
- c. Mr. Hyatt reported that Hugo dumped only 5 inches of rain. Aerial surveillance shows that several of the salt marsh mosquito breeding areas are filled with mud which will suffocate larvae and eggs. If a mosquito problem develops, it may come from floodwater mosquitoes and <u>Culex pipiens guinquefasciatus</u>.
- d. Mr. Hyatt is also concerned with filth flies which have been a problem after hurricanes in the past.
- e. Preventive Medicine is operating with two people per day who spend all their time checking water supplies. Vector surveillance will resume as soon as possible. Preventive

Medicine and CCMC will work closely in monitoring potential vector levels.

f. On 27 Sep 89 LT Cope, LCDR Williams and Mr. Hyatt met to discuss surveillance and emergency control plans should the need arise. A brief was presented on how to acquire the services of DVECC if required. Following this meeting, we briefed RADM Bump and CAPT White on anticipated problems and told them that CCMC and DVECC were prepared to initiate emergency vector control at Naval Station, Charleston if so desired.

S. E. Cope

Head, OCCHLTH/PREVMED,

### MEMORANDUM

From: Assistant Operations Officer

To: OIC, DVECC

LT C. D. Kimsey

Subj: POST-HUGO FACT FINDING TRIP TO SOUTH CAROLINA

1. On 3-5 October 1989, LT Stanton E. Cope, MSC, USNR and LT D. M. Claborn, MSC, USNR traveled to Charleston and Beaufort, S.C. to contact Preventive Medicine and vector control personnel regarding post-hurricane vector control preparedness.

### The following personnel were contacted:

CAPT R. White Chief of Staff, NAVSTACHRS

· LCDR R. W. Williams Head, Preventive Medicine, NAVMEDCLNCHRS

LT L. F. Lindsey Assistant PWO, Naval Weapons Station, Charleston (NWSCHRS)

\*LT C. NcNew Public Affairs Officer,

DI C. NCNEW Public Affairs Officer,
NWSCHRS

NAVHOSP, Beaufort
- ENS J. Bobich EHO, NAVSTACHRS

ENS S. Richardson Head, Operating Management

Department, NAVHOSP,
Beaufort
HMC B. Winner PMT, BRMEDCLN, MCAS

HMC C. E. McDowell PM Chief, NAVMEDCLNCHRS

- HM1 R. K. Larsen PMT, NAVMEDCLNCHRS
HM2 C. Steele LPO, OCCHLTH, MCAS

• Mr. M. Hyatt Director, Charleston County

Mosquito Abatement

Mr. C. W. Bennett Friendlagist NAVEACENCOM

Mr. C. W. Bennett Entomologist, NAVFACENGCOM Ms. S. E. Bartku Entomologist, NAVFACENGCOM

• Mr. C. A. Ducker Pest Control Leader,

NAVSTACHRS
• Mr. R. Braddock PCO, NWSCHRS

Mr. R. Graham PCO, NWSCHRS
Mr. L. Seymour PCO, NWSCHRS

Mr. C. Gruver PCO, NSWCHRS
Mr. D. Arnold Director, Beaufort County

Mr. B. Armoid Director, Beautort County

Mosquito Control (BCMC)

Ms. E. Hager Biologist, BCMC

Mr. J. Roberts Pilot, BCMC Mr. C. Fish Pilot, BCMC

Mr. C. Barnhart Flight Engineer, BCMC Mr. M. Thibault Flight Engineer, BCMC

### 3. Findings

- a. The Naval Weapons Station has a serious problem with mosquitoes. Landing counts were in excess of 75 per minute, mainly <u>Aedes sollicitans</u>. Shipboard personnel reported being bitten on mess decks. Pest control was operating only one of their LECO HD's from 4 AM until conditions became unfavorable for ULV. Recommendations included operating both sprayers during evening hours as much as manpower will allow.
- b. Hurricane debris is being piled up around the base in anticipation of removal. These piles were full of resting mosquitoes which would commence biting when disturbed. The Buffalo Turbine of NWS was inoperable. LCDR Williams wrote a letter requesting that DVECC provide a Buffalo Turbine and personnel to spray a residual pesticide on debris and vegetation. LT Claborn and HM1 Spafford from DVECC, JAX were dispatched with said equipment on 8 October 1989.
- c. Pest control personnel at the Naval Station spent the first week post-Hugo cutting up debris and were just now beginning mosquito control efforts. Mosquito populations at the Activity were intolerable in some areas.
- d. As predicted, mosquito complaints are coming in from all over Charleston County. Pest species are primarily pool and woodland breeders such as <u>Psorophora columbiae</u>, <u>Ps. ferox</u> and <u>Ae. vexans</u>. Martin Hyatt expects things to get worse before they get better.
- e. At the suggestion of DVECC personnel, Mr. Bill Bennett was contacted and inquiry was made as to whether the Air Force could spray the Weapons Station. Mr. Bennett arranged for the base to be sprayed at 1600 on 9 Oct 89. Follow up sprays will be done if deemed necessary by mosquito surveillance.
- f. L. A. Williams, director of South Carolina Vector Control, is trying to convince the Federal Emergency Management Association (FEMA) to spray all of Charleston County.
- g. Bruce Francey and Don Eliason from CDC, Fort Collins are in Charleston conducting mosquito studies, including arbovirus isolation attempts.
- h. Hugo's impact on the Beaufort area was minimal. Residents report that mosquito populations are quite high due to recent heavy rains. <u>Culicoides</u> is still the number one pest.
- i. David Arnold stated that he is willing to help the Navy in aerial spray efforts should the need arise. He has a Super DC-3 equipped with 10 nozzles. DVECC personnel accompanied the flight team on a spray mission. Arrangements had been made for the plane to assist in control efforts in Charleston.
  - j. Mr. Arnold provided DVECC with several maps of the area,

numerous technical reports on mosquito control and information pamphlets concerning pesticides and mosquitoes. He is also willing to loan us material for <a href="#">Aedes albopictus</a> surveillance.

S. E. Cope



### DEPARTMENT OF THE NAVY

NAVAL HOSPITAL

CHARLESTON, SOUTH CAROLINA 29408-6900

6250 310.3/47 04 OCT 89

From: Commanding Officer

To:

Officer in Charge, Disease Vector Ecology Control Center, Jacksonville

F1 32212-0043

Subj: REQUEST FOR VECTOR CONTROL ASSISTANCE

Ref:

(a) Assist Visit by LT Claborn and LT Cope, DVECC, of 3-4 OCT 89

1. During disaster relief efforts provided by personnel from your command after Hurricane Hugo, reference (a), mosquitoe landing counts at the Naval Weapons Station, Charleston showed increased vector activity which is effecting personnel morale and work performance. Aggressive pest control measures are underway, however, due to the extent of the problem, additional equipment is requested from your command, specifically the Buffalo Turbine and personnel for operation.

2. Your assistance is greatly appreciated. If you have any questions, please contact LCDR Williams, Head, Preventive Medicine Division at COMM: (803) 743-6246/5507 or AUTOVON: 563-6246/5507.

R.W. WILLIAMS By direction

# LOGISTIC

SUPPORT



### DEPARTMENT OF THE NAVY

# NAVY DISEASE VECTOR ECOLOGY AND CONTROL CENTER NAVAL AIR STATION

#### JACKSONVILLE, FLORIDA 32212-0043

6440 01/930705

3 NOV 1989

From: Officer in Charge, Navy Disease Vector Ecology and Control

Center, Jacksonville

To: Commanding Officer, Navy Environmental Health Center

Subj: AFTER ACTION REPORT FOR LOGISTICS AND SUPPORT OF VECTOR CONTROL EFFORTS IN THE AFTERMATH OF HURRICANE HUGO

Ref: (a) My 1st end 6440 00/930601 of 2 Nov 89 on Team Leader

(VCT-ONE)ltr (b) My 1st end 6440 00/930702 of 3 Nov 89 on Asst. Team

Leader (VCT-TWO) 1tr (c) My 1st end 6440 00/930604 of 3 Nov 89 on Team Leader (VCT-THREE) 1tr

Encl: (1) NAVDISVECTECOLCONCENJAX Deployment Overview

(2) MMART Logistic Support - Topics of Discussion

1. After review of references (a), (b), and (c), enclosures (1) and (2) are submitted for your review and comment.

# NAVDISVECTECOLCONCENJAX DEPLOYMENT OVERVIEW FOLLOWING VECTOR CONTROL EFFORTS IN THE AFTERMATH OF HURRICANE HUGO

In mid-September, 1989, Hurricane Hugo began to sweep across the Caribbean with sustained winds of up to 180 mph. On September 18, it struck the island of St. Croix in the U.S. Virgin Islands. The storm remained stationary over this island from 0330 until 0500, causing unprecedented destruction. Approximately three hours later, Hugo's eye passed 2 miles ENE of Roosevelt Roads, Puerto Rico. On the following Friday, Hugo's full force struck Charleston, SC. Extensive damage to infrastructure occurred at all three locations. Flooding and the accumulation of large areas of standing water promoted the development of large numbers of mosquitoes. The destruction of buildings and the disruption of regular waste management efforts promoted the development of large numbers of filth flies and a potential rodent problem.

These threats to human health precipitated two separate requests to the Navy Environmental Health Center, Norfolk, VA (NEHC) for assistance. The first came from COMNAVACTSCARIB to provide vector control assistance to NAVSTA Roosevelt Roads and several nearby installations. A second request was received shortly thereafter from the U.S. Public Health Service to provide assistance to the island of St. Croix, U.S. Virgin Islands. As a Mobile Medical Augmentation Readiness Team (MMART) operation, NEHC mobilized two Vector Control Teams (VCT-1 & VCT-2), utilizing personnel from the Navy Disease Vector Ecology and Control Center, Jacksonville, FL (DVECC JAX), and the Navy Environmental and Preventive Medicine Unit No. 2. Norfolk, VA (EPMU-2). A further request for vector control assistance came to DVECC JAX from the Naval Hospital, Charleston, SC, and a third vector control team (VCT-3) was dispatched in response. The mission of each team was to provide technical and operational vector control assistance to the requesting authorities until vector population levels had declined to pre-disaster levels and local public health efforts could be resumed.

Within 20 hours of notification to deploy, VCT-1 and VCT-2 and their accompanying gear were staged on the flight line awaiting air transport to Puerto Rico and St. Croix, respectively. Compiling, packing, and certifying equipment and pesticides for air shipment was a team effort on the part of all military and civilian personnel at both DVECC JAX and EPMU-2. Any deployment is a cooperative effort, and special thanks must be made to NSC Preservation and Packaging and Air Operations at both NAS JAX and NAS Oceana. Further acknowledgment must go to CINCLANTFLT Transportation and the Maryland Air National Guard whose cooperation and willingness to help vastly increased the ease of mobilization and deployment.

### Vector Control Efforts on Puerto Rico

Vector Control Team-1 was composed of LCDR T.W. Gale. MSC. USN. Medical Entomologist and Team Leader; LTJG S.E. Rankin, MSC, USNR. Medical Entomologist; Hill W.E. Krothe, USN. Preventive Medicine Technician and HM2 A. L. Gourley, USN, Preventive Medicine Technician, all from DVECC JAX. VCT-1 arrived at NAVSTA Roosevelt Roads via C-130 on the night of September 28, 1989. They reported to COMNAVACTSCARIB and quickly established liaison with the local Preventive Medicine Service and Pest Control Shop. A quick assessment of the situation revealed that, in addition to the higher-than-normal mosquito counts, the destruction of windows and screens in housing areas magnified the problem. Hordes of Aedes taeniorhynchus, a salt marsh mosquito, were breeding in the large expanse of surrounding mangrove swamps, and base personnel reported that they were being "eaten alive." Because environmental considerations precluded poisoning the aquatic immature stages (larvae) in the ecologically sensitive mangrove swamps, the mosquito control strategy focused on adulticide sprays. VCT-1 carried the latest in a series of light-weight, emergency ultra-low volume (ULV) insecticide sprayers. The Contingency ULV Spray System (CUSS-1), designed and developed by DVECC JAX's Testing and Evaluation Department, is an 8-lb. electric spray system that attaches to any motor vehicle and runs off the vehicle's battery. Larger, commercial ULV sprayers were also used. Because of the very minute droplet size produced, ULV spray operations must be done under atmospheric conditions that usually exist only at dawn and dusk. An intensive ULV spray schedule was begun, with treatments from 0500 to 0700 and from 1600 to 1900 each day. Between the morning and evening spray cycles, team members conducted vector surveillance and control on NAVSTA Roosevelt Roads, NSGA Sabana Seca, and the town of Luquillo on the island of Puerto Rico, and also at NAF and Camp Garcia on the island of Vieques. After 10 days of intensive effort, mosquito populations were reduced to an acceptable level. Vector surveillance and control responsibility reverted to PMS and PWC, and VCT-1 returned to Jacksonville on October 12.

### Vector Control Efforts on St. Croix

Vector Control Team-2 was composed of LCDR H.R. Stevenson, MSC, USN, Medical Entomologist and Team Leader; HM1 A.M. Cardwell, USN, Preventive Medicine Technician; and HM1 E.M. Pressley, USN, Preventive Medicine Technician, from EPMU-2; in addition to LT J.M. Conlon, MSC, USN, Medical Entomologist and HMCS K.L. Roden, USN, Preventive Medicine Technician, from DVECC JAX. The elements from EPMU-2 arrived on St. Croix on September 31, followed by the personnel from DVECC JAX on October 1. VCT-2 quickly meshed with elements of the Alabama National Guard and established liaison with the Federal Emergency Management Agency (FEMA), USPHS and representatives of COMNAVACTSCARIB. Almost immediately, they began vector surveillance in and around the Alexander Hamilton International Airport and the National Guard's compound. Because of the extensive destruction of buildings and

complete disruption of waste management services, the filth fly problem was significantly greater here than in Puerto Rico. Effective filth fly control was achieved with residual pesticides dispersed by backpack sprayers and Flytek poison bait, which was dispersed by hand. Extensive mosquito surveillance revealed that Aedes aegypti, the primary vector of dengue, was breeding throughout, especially in the town of Christiansted. Many breeding sites were cisterns used for drinking water, so larvicides again could not be used. VCT-2 initiated a successful public relations effort and received permission from island authorities to conduct ULV operations on October 3, 1989. They were equipped with three truck-mounted, electric ULV sprayers and a thermal fogger, which uses heat to produce a fine, very visible pesticide mist.

In addition to vector control and surveillance, VCT-2 repaired local pest control equipment and trained local Public Health representatives in the proper use of ULV spray equipment. Following 16-hour days and life under very primitive conditions, VCT-2's success was demonstrated by the significant reduction of vector population levels. They returned to their respective units on October 12.

### Vector Control Efforts in Charleston, SC

Vector Control Team-3 was composed of LT D.M. Claborn, MSC, USNR, Medical Entomologist and Team Leader and HM1 D.M. Spafford, USN, Preventive Medicine Technician, both from DVECC JAX. They drove to Charleston on October 8, where they coordinated their efforts with NAVSTA Preventive Medicine Services and the NWS Pest Control Shop. They also established liaison with the Charleston County Mosquito Abatement District and the Air Force Aerial Spray Team. A major problem on these bases was the accumulation of large piles of brush from the many fallen trees. These dense deadfalls provided secure resting places for various man-biting mosquitoes. Surveillance revealed landing counts in excess of 75 mosquitoes per man per minute. The brush piles were often 10 ft. high and thick enough to be impenetrable to conventional ULV space spraying. In this unique situation, VCT-3 used residual pesticides applied with a trailer-mounted turbine sprayer. This machine, generally used for controlling pests on turfgrass and landscape plants, has a high pressure blower with nozzle velocities up to 175 mph. This power, combined with the heavier droplet produced by this machine, easily penetrated the dense masses of fallen vegetation that Hugo had produced. The residual action of the pesticide promised to kill the majority of mosquitoes that used the brush for shelter over a period of several weeks.

VCT-3 also acted as the ground team to monitor the aerial applications provided by the Air Force Aerial Spray Team. VCT-3 continued operation while instructing local PWC pest controllers how best to utilize the turbine sprayer. After a significant reduction in mosquito population levels, the turbine sprayer was loaned to NAVSTA Charleston and VCT-3 returned home on October 13.

### MMART: A Concept That Works

The MMART concept was developed to provide for the rapid mobilization of medical assets to augment operational forces in the event of natural disaster or armed conflict. These recent deployments amply demonstrate that NEHC and its Echelon 4 commands are second to none with respect to readiness and proficiency whenever and wherever they are needed. Each of the above areas presented a unique situation and unique problems that were readily addressed and remedied on site by each Vector Control Team. The many long hours of training and practice for MMART deployment have, without a doubt, proven their value, allowing an unprecedented simultaneous deployment of three highly successful Vector Control Teams into three separate geographic

### MMART LOGISTIC SUPPORT - TOPICS OF DISCUSSION

It is inherent to the development of the MMART process to identify or correct existing problems or bring to the attention of the cognizant authority items that need to be considered prior to the next real emergency. The following lists of topics are presented with the hope that the resultant exchange of ideas will enhance the overall readiness of NEHC's very successful MMART program.

### A. Mission Funding

### 1. Out-side DON Funding

NEHC and the Echelon 4 commands need to explore the utilization of out-side DON disaster relief funding of MMART deployments. This funding probably could not have been used on the deployment of VCT-1 to Roosevelt Roads, as the request came from a DON activity. However, the deployment of VCT-2 to St. Croix at the request of the USPHS might possibly have been fully funded by the requesting agency. Director of Military Support (DOMS) indicated that our deployment to St. Croix was assigned a mission funding number as early as the 28 September. Our FEMA mission assignment number 841DR-VI-DOM-1N for St. Croix might have been used to reimburse our command for any and all expenses. This source of funding might have been exploited to arrange for dedicated aircraft, or to facilitate resupply and retrograde activities.

Even though it is generally thought that reimbursement will be at the DON level, which would preclude the funds reverting to NEHC, our fiscal experts need to fully explore any mechanism by which we can utilize FEMA funds. In the same venue, it would also be advisable to contact USAID/State and establish a similar funds transfer SOP mechanism for funding disaster assistance to foreign governments. In these hard times of fiscal limitations every avenue must be explored to continue to make MMART as viable a concept as possible. If our services are really warranted by an outside agency then we should be honored that they are willing to pay - and let them.

## 2. Transportation Accounting Codes (TAC No.)

Neither VCT-1 or VCT-2 was given a TAC code to assist in their retrograde following mission completion. While opportune lift is often available and is often "no cost," most transportation coordinators require the inclusion of a viable TAC before processing a transportation request. Team members, however, need to be aware of the high cost of transportation and that a request for a dedicated C-130 from St. Croix to Norfolk could cost as much as 20K. CINCLANTFLT Transportation provided the TAC used to retrograde VCT-1's cargo to DVECC JAX.

### 3. Equipment Transfer to Local Authorities.

Following a natural disaster where large quantities of local equipment and supplies are lost, it would not be unreasonable for local officials to request assistance of not only manpower but equipment. It is not also unreasonable to expect that a request for assistance might really be a "veiled" request for material support in the form of "permanent equipment loans." The appearance of the lack of generosity or lack of cooperation, especially following press accounts of the pitiful condition of disaster victims, could lead to a negative image of MMART and the Navy. This problem needs to be given serious consideration and advice given prior to any future deployment.

### B. Communications & Resupply

### 1. Message Traffic

Recent events including both the deployment following Hugo and exercise Proud Eagle '89 have illustrated the limitations of message traffic. If message traffic is the sole communication link all parties must be aware that they are probably dealing with information that is 24-48 hours old and might in no way reflect the current situation. Watchstanders should be encouraged to be particularly persistent and patient when dealing with the local Communication Centers. During any disaster assistance deployment, alternative ways of communication should be encouraged and explored.

### 2. Minimize Violation

A communication minimize was in effect for both Roosevelt Roads and St. Croix during the deployment of VCT-1 and VCT-2. All messages to those areas should have included the following statement:

Minimize considered by: (Rank) (Name) (AUTOVON No.)

### 3. Resupply

Resupply efforts were hindered by the fact that all military flights contacted would not divert to NAS JAX for the small amount of cargo under consideration. This Center initiated two tests of the 24-hour delivery service of the U.S. Mail. The first package was a standard 10" x 15" in envelope and arrived within 48 hours. The second was a package 8" x 12" x 12" that reached the team after seven days just prior to VCT-1's departure. Resupply by civilian passenger and cargo airlines was also investigated with negative results. ADAPCO Inc. of Orlando, Florida, stated that they could provide pesticides and equipment by sea within three days to the island of St. Croix. The capability of commercial pesticide and equipment distributors along with commercial air and surface cargo carrier to support future MMART operation needs to be assessed.

### C. Airlift Transportation

### 1. Air National Guard

In general, National Air Guard C-130's maintain an optimum of flexibility as to what they would ship and deviation from scheduled flight plans. The National Guard aircraft were not adverse to picking up "cargo and passengers of opportunity." During the deployment of VCT-1 they deviated from their scheduled flight path to drop the team at Roosevelt Roads rather than San Juan. The Maryland Air Guard flight to deploy VCT-1 was arranged and coordinated through National Guard Air Operation at Andrews AFB.

### 2. Dedicated Air Force Aircraft

All Air Force MAC, QUICKTRANS, and LOGAIR aircraft followed the rules and regulations in excruciating detail. The Air Force aircraft often have onboard load masters and insisted on the utilization of 463-L pallets and strict adherence to hazardous cargo regulations. The Air Force C-5 from the 105 MAG out of Stewart, N.Y. was arranged by CINCLANTFLT Transportation Office.

### 3. NALO Airlift Requests

Requests were put in for NALO flights for both the Roosevelt Roads and St. Croix deployments. Flight requests must be made by message to NAVAIRLOGOFF New Orleans, LA, and take at least 72 hours. NALO flights often utilize C-12 aircraft which are adequate for passengers, but have little cargo capacity. A large number of requests with higher priority prohibited the utilization of NALO during the Hugo disaster relief effort.

### D. MMART Pesticides

### 1. Bulk MMART Pesticides

The shipping of three 55 gallon drums of malathion from DLA Memphis, TN, by truck took approximately 48 hours. Shipping could only be done to CONUS military bases where the customer would bear the responsibility of making arrangements for packing, certification, and air shipment to its final destination. Efforts need to be pursued to stage MMART bulk pesticides nearer the Echelon 4 commands (i.e., DSRG Richmond, VA) with a 12-24 hour delivery time to the point of departure. Onsite funding of local pesticides and equipment by the deployed VCT also needs to be explored.

### 2. NA1993 Class Pesticides (Cargo Aircraft Only)

All MMART pesticides with this classification need to be reviewed for possible deletion as MMART items. A situation could develop where a deployed team would be separated from its gear because a load master refused an NA1993 item. An example of this problem is that Dursban 4E, SSN 6840-00-402-5411, comes from two manufacturers, one formulation includes a "trace of xylene" and is DOT regulated for "Cargo Aircraft Only," the other formulation is not restricted and can be transported with passengers. In the deployment to St. Croix the three 55-gal. drums of malathion were shipped with the VCTs, however, a 5-gal. pail of Dursban 4E manufactured by SMC could not. (See Attachment A)

### 3. Shipping of Hazardous Material DD Form 1387-2

In addition to pesticides - aerosols, wet cell batteries, motor oil, lantern fuel, fuel tanks, pesticide tanks, etc. are all consider hazardous items for air shipment and must be packed and certified prior to loading. Each of these items MUST have A DD Form 1387-2 SPECIAL HANDLING DATA/CERTIFICATION document prior to air shipment. These certificates can come only from qualified packers at installation NSC.

### 4. MMART Logistic and Support Training

Future MMART drills by this Center will include phone contact and visits by Center personnel to familiarize them with the location and personnel located at the following activities:

CINCLANTFLT Transportation AV 564-6865/6852 National Guard Air Operations AV 858-6001/2/3/4 DOMS AV 227-2696 (C) (202) 696-2993 FEMA Region 1 NAS JAX Air OPS x 2511 NAS JAX Passenger Terminal x 3827 x 2537 NAS JAX Air Cargo Terminal NSC JAX 24 hour number x 2656/7/8 NSC JAX Customer Service (C) (904) 779-3000 NSC JAX Trans. Bldg. #110 x 3559 NSC JAX Packing & Cert. x 3105 (C) (904) 772-5060 NSC JAX Receiving NSC JAX QUICKTRANS Term. (C) (904) 772-2300

### MILITARY AIRLIFT REGULATIONS FOR SPECIFIED PESTICIDES

### NSN's NOT REGULATED FOR TRANSPORT ABOARD MILITARY AIRCRAFT

6840-00-242-4217 6840-00-242-4219 6840-00-400-2140 6840-01-151-4884 6840-01-183-7244

### 6840-00-402-5411

Trade Name: Dursban 4-E; Dursban (R) 4E Insecticide
Manufacturer: Ford's Chemical & Service, Inc.; Dow Chemical Co.

Issue: 5 gal. cn.
Proper Shipping Name: CHLORPYRIFOS
Hazard Class: ORM-A
Label: None
ID No.: NA 2783

L/S Group: 28 - No compatibility restrictions

Packaging Paragraph: 11-2
Aircraft Restriction: None
Reportable Quantity: 1 pound

Trade Name: Dursban 4E; Dursban N
Manufacturer: Southern Mill Creek Products, Inc.; Dow Chemical
Company

Flash Point: 84 F; 85 F Proper Shipping Name: ORGANOPHOSPHORUS PESTICIDE LIQUID, N.O.S. Hazard Class: Flammable Liquid Label: Flammable Liquid

Issue: 5 gal. cn. (DOT 17C)

ID No.: UN 2784 L/S Group: 18 - Incompatible with L/S groups 1-7 Packaging Paragraph: 6-6

# Aircraft Restrictions: Cargo Aircraft Only, DOT-E 7573

Trade Name: Excelcide Malathion Concentrate; Cythion Manufacturer: The Huge Co.; Hub States Corp.
Issue: I gal. cn.
Proper Shipping Name: MALATHION
Hazard Class: ORM-A
Label: None

ID No.: NA 2783
L/S group: 28 - No compatibility restrictions

6840-00-655-9222

Packaging Paragraph: 11-2 Aircraft Restrictions: None

Enclosure (1)

### 6840-00-655-9222 (Cont'd)

Reportable Quantity: 10 pounds

Trade Name: Michlin Malathion EC-5 Manufacturer: Michlin Diazo Products Corp.

Issue: 1 gal. cn.

Flash Point: 90 F

Proper Shipping Name: 'INSECTICIDE, LIQUID, N.O. S. Hazard Class: Flammable Liquid

Label: Flammable Liquid

ID No.: NA 1993

L/S Group: 18 - Incompatible with L/S Groups 1-7

Packaging Paragraph: 6-6

Aircraft Restrictions: None

### 6840-00-685-5438

Trade Name: Michlin Malathion EC-5 Manufacturer: Michlin Diazo Products Corp. Issue: 5 cal. cn. Flash Point: 90 F Proper Shipping Name: INSECTICIDE, LIQUID, N.O.S. Hazard Class: Flammable Liquid Label: Flammable Liquid ID No.: NA 1993

L/S Group: 18 - Incompatible with L/S Groups 1-7 Packaging Paragraph: 6-6

Aircraft Restrictions: None

Trade Name: O-I-565; Malathion 5 LB E.C. Manufacturer: Bought to Spec.; Baird and Mcguire, Inc.

Issue: 5 gal. cn. Proper Shipping Name: MALATHION

Hazard Class: ORM-A

Tabal: None

ID No.: NA 2783 L/S Group: 28 - No compatibility restrictions

Packaging Paragraph: 11-2

Aircraft Restrictions: None

Reportable Quantity: 10 pounds

### 6840-00-753-4963

Trade Name: DEET (Insect Repellent) Manufacturer: SAMEX Chemicals, Inc.

Issue: 2 oz bottle

Flash Point: 73 F Proper Shipping Name: INSECTICIDE, LIQUID, N.O.S.

Hazard Class: Flammable Liquid

Label: Flammable Liquid ID No.: NA 1993

### 6840-00-753-4963 (Cont'd)

L/S Group: 18 - Incompatible with L/S Groups 1-7 Packaging Paragraph: 6-6 Aircraft Restrictions: None

Trade Name: Airosol Insect Repellent
Manufacturer: Airosol Company, Inc.
Not Regulated for Transport Aboard Military Aircraft

## 6840-00-753-5038

Trade Name: MIL-I-22772/Ships, Insecticide 2% Diazino Manufacturer: Bought to Spec.
Tsaue: cn., 25 pounds

Issue: cn., 25 pounds
Proper Shipping Name: DIAZINON
Hazard Class: ORM-A

Label: None ID No.: NA 2783

L/S Group 28 - No compatibility restrictions Packaging Paragraph: 11-2 Aircraft Restrictions: None Reportable Quantity: 1 pound

# 6840-00-926-1481

Trade Name: Cythion Insecticide
Manufacturer: American Cyananid Co.
Issue: 55 gal. dr.
Proper Shipping Name: MALATHION
Hazard Class: ORM-A
Label: None
ID No.: NA 2783
L/S Group: 28 - No compatibility restrictions

Packaging Faragraph: 11-2 Aircraft Restrictions: None Reportable Quantity: 10 pounds

Aircraft Restrictions: None

# 6840-01-067-6674

Trade Name: Insecticide; Insecticide, D'Penothrin 2% Manufacturer: Airosol Co.; Bulk Chemical Distributors Issue: 12 oz aerosol cn
Proper Shipping Name: INSECTICIDE, LIQUIFIED GAS Hazard Class: Non-Flammable Gas
Label: Non-Flammable Gas
ID No.: NA 1968
L/S Group: 21 - No compatibility restrictions
Packaging Paragraph: 9-6, 9-8

105

### 6840-00-926-1481 (Cont'd)

Trade Name: Insecticide Aerosol D-Phenothrin 2% Manufacturer: ACCRA PAC, Inc. Issue: 12 oz aerosol cn Proper Shipping Name: COMPRESSED GAS, N.C.S.

Hazard Class: Non-Flammable Gas

Label: Non-Flammable Gas ID No.: UN 1956

L/S Group: 21 - No compatibility restrictions

Packaging Paragraph: 9-6, 9-8, 9-10

Aircraft Restrictions: None

### 6840-01-169-1842

Trade Name: Cythion Insecticide Manufacture: American Cyananid Co. Issue: 5 gal. cn.

Proper Shipping Name: MALATHION

Hazard Class: ORM-A

Label: None

ID No.: NA 2783

L/S Group: 28 - No compatibility restrictions

Packaging Paragraph: 11-2

Aircraft Restrictions: None

Reportable Quantity: 10 pounds

### 6840-01-203-6161

Trade Name: Dursban 1-5 ULV Moscuitocide Manufacturer: Clarke Outdoor Spraying Co. Issue: 5 gal. cn.

Proper Shipping Name: CHLORPYRIFOS

Hazard Class: ORM-A

Label: None

L/S Group: 28 - No compatibility restrictions

Packaging Paragraph: 11-2

Aircraft Restrictions: None Reportable Quantity: 1 pound

106



U.S. Department of Transportation Research and Special Programs Administration 400 Seventh Street, \$.W. Washington, C.C. 20590

### DOT-E 7573 (THIRD REVISION)

JL 7 1988

- 1. The Department of Defense (DCD), Falls Church, VA, is hereby granted an exemption from certain provisions of this Department's Hazardous Materials Regulations to offer hazardous materials described herein for transportation in air commerce subject to the limitations and special requirements specified berein. This exemption provides no relief from any regulation other than as specifically stated.
- 2. ZASIS. This examption is based on the DOD's application dated March 29, 1938, submitted in accordance with 49 CFR 107.105 and the public proceeding thereon.
- 3. HAZARDOUS MATERIALS (Descriptor and class), Aircraft loaded with military suplosives and ammunition classed as explosives A, B, or C and other hazardous materials which are sither not authorized to be shipped by cargo aircraft only, or are in quantities greater than those authorized in 49 GR 172,101 for cargo aircraft only.
  - 4. PROPER SHIPPING NAME (49 CFR 172.101). The proper shipping name for each hazardous material as prescribed in Section 172.101.
- 5. REGULATION AFFECTED. 49 CER Subpert B of Part 107, Part 172 and 175.
- 6. MODE OF TRANSPORTATION AUTHORIZED. Cargo sircrest only.
- 7. SAFETY CONTROL MEASURES.
  - a. Authorized Hazardous Materials. Hazardous materials authorized by this examption are limited to materials authorized to be transported by common carrier by motor vehicle in conformance with 49 CFR Parts 107 and 171-179.
  - b. Authorized Airports.
    - (1) Transport of materials authorized by this examption is restricted to U.S. military bases and the herein maned civil airports. The DOD must have advance parmission from the owner or operator of each civil airport where the material is to be loaded or unloaded or where the aircraft is to land while the material is on board.



Danies

(2) Civil airports presently authorized for scheduled LOGATR/OUICKTRANS mir routes:

Charleston International Airport (Charleston ATE), Charleston, South Carolina;

Chayanna Municipal Airport (Francis E. Warren AFB),

Chayanna, Wycming;

Banger International Airport, Banger, Maine:

Duluth International Airport, Duluth, Minneasta;

Albuquerque International Airport (Kirtland AFB), Albuquerque, New Mexico:

Wair-Cook International Airport, Indianapolis, Indiana;

Potatson Field, Colorado Springs, Colorado.

(3) When the distinction is changed after departure because of seather or other unforeseen discumstances, permission from the owner or operator of the alternate airport shall be obtained as soon as practicable.

### c. Loading and Stowage of Materials.

- (1) Loading and stowage of military explosives (including ammunition) and other hazardous materials about air creat shall be in accordance with procedures specified in Air Jorda Regulation (AJR) 71-4. All loading and unloading operations under this exception shall be monitored by a qualified DOD representative or a technician qualified in accordance with 14 CFR 121.433s or AFR 71-4 to ensure compliance with the prescribed procedures of AFR 71-4.
- (2) During loading and unloading, no person may smoke, carry a lighted digaretra, digar or pipe, or operate any device capable of causing an open flame within 50 feet of the sizeraft.
- (3) Unless emergency conditions prescribe otherwise, the loading and unloading of the sircraft shall be conducted at a safe distance from heavily populated areas, and from any place of human abode or assembly. However, at an airport where the airport owner, operator or authorized representative thereof has designated a specific location for loading or unloading, explosives may not be loaded or unloaded at any other location.

### d. Operational Requirements.

- Operation of the aircraft during take-off, enrouts, and landing must be conducted at a safe distance from heavily populated areas.
  - (a) Defore movement of the aircraft prior to take-off, the pilot of the aircraft shall notify the control tower of the class(as) of emplosives(s) (including ammunition) on board.
  - (b) The pilot of the aircraft, prior to entering an sirport traffic area, shall notify the control tower of the class(as) of explosive(s) (including ammunition) on board and request this information be relayed to the appropriate airport officials.
    - (t) When under radar control during the approach and landing phase, the pilot shell request appropriate vectors so as to evoid heavily populated areas.
- (2) No parsons other than required flight craw members and mission essential personnel may be carried on the air craft. Frior to take-off, all craw members will be instructed in proper procedures to be followed during an emergency involving hazardous materials.
- (3) No fueling operations of the aircraft may be conducted during the loading and unloading of explosives.
- (4) Fuel tanks of vehicles may not be filled to more than 75% of their capacity.

## 8. SPECIAL PROVISIONS.

a. This eremption applies only to transportation in air commerce of suplosives and other hezardous materials deemed essential to national defense via DOD contract similift services and civil air operators under sontract to the Military Airlist Command (MAC).

b. Prior to its use, approval for use of this exemption must be obtained from either the Deputy Chief of Staff, Air Transportation MAC; the Director of Transportation, Air Force Logistics Command; the Mayal Material Transportation Office; or their authorized representatives.

### SUMMARY

The success of any deployment is, to a great extent, a direct reflection of the enthusiasm and capabilities of its supporting elements. A decisively pro-active stance by the staff of NAVDISVECTECOLCONCEN Jacksonville was the key to the success of these three deployments. The staff took the initiative by establishing communications and maintaining daily contact with each team and NAVENVIRHLTHCEN. These efforts involved late hours and weekends and supplied much critical information. A high level of resourcefulness, tact, and persistence was demonstrated by the support staff as it examined and explored the feasibility of numerous logistic and transportation alternatives. This superlative staff support significantly contributed to the success of all three teams by having the right information or right material at the right place and time.

# APPENDICES

# APPENDIX I-AMERICAN RED CROSS FACT SHEET

# American Red Cross

#### FACT SHEET

American Red Cross Emergency Disaster Relief Campaign

Puerto Rico, U.S. Virgin Islands, South Carolina, North Carolina, Georgia, Virginia, Tennessee, West Virginia

### General Situation

Severe damage to homes, infrastructure, power, and telephone services--total damage still being tallied

A total of 532 Red Cross shelters opened

At least 73,000 people stayed in Red Cross shelters

At least 32 emergency response vehicles (ERVs) have been assigned to stricken areas in the U.S. mainland

### Specifics by Area

### South Carolina:

9 counties around the Charleston area received extensive damage to homes, buildings; loss of power and telephone service

162 shelters opened (at peak of operation)

34,000 people housed (peak)

963 dwellings destroyed, 2,042 severely damaged, 29,000 with minor damage

Carolina Lowcountry Red Cross Chapter building in Charleston received structural damage

230 non-local Red Cross disaster workers in the field with thousands of local volunteers

### North Carolina:

Some damage to homes, loss of electricity

75,000 shelters opened (peak)

5,000 people housed (peak)

### I-AMERICAN RED CROSS FACT SHEET

### Georgia:

25 Shelters opened (peak)

3,500 people housed (peak)

### West Virginia:

4 shelters opened

- 1,250 families affected by wind and flooding
- 4 disaster vehicles from EOH

### Virginia:

2 shelters opened

300 people housed

### Tennessee:

3 shelters opened

### Puerto Rico:

35,000 families may be affected, 12,000 homes destroyed, 15,000 homes received major damage, 8,000 with minor damage; significant shortages of water and gasoline, disrupted electricity and telephone service

220 shelters opened

24,000 people served in Red Cross shelters

97,000 meals served

15,000 cots, blankets, tents sent by Red Cross

190 Red Cross disaster workers sent in for entire operation; 50 more being recruited

### U.S. Virgin Islands:

St. Thomas

- 6,000 families affected
- 6,000 homes destroyed or damaged
- 6 shelters opened (peak)

Up to 6,000 meals served per day by one shelter alone

### I-AMERICAN RED CROSS FACT SHEET

### St. Croix

Up to 25,000 homes affected

10 shelters opened

18,000 people sheltered

16 feeding sites opened

### St. John

600 families affected

600 homes affected

1 shelter opened

70 people sheltered

The yearly budget for disaster operations is totally depleted only three months into the fiscal year. The funds required to provide disaster relief assistance to victims of Hurricane Hugo will exceed \$40 million. In order to provide disaster relief for the remainder of FY 89 - 90. more funds are urgently needed.

Disaster Fund opening balance for FY 89-90 \$18.9 million

Domestic disaster commitments prior \$ 8.5 million to Hurricane Hugo

Hurricane Hugo commitments (estimate) \$42.0 million

Current status of fund \$-31.6 million

Projected additional relief needs \$10.4 million for balance of FY 89-90

Campaign goal \$42.0 million

Note: The above disaster statistics represent the best data available as of September 26, 1989. Updated figures will appear in future campaign materials.

## APPENDIX II-HURRICANE HUGO PHOTOS



Close-up of the portable light weight emergency Ultra-low volume sprayer

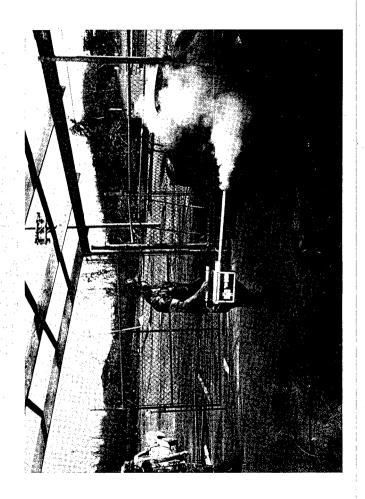






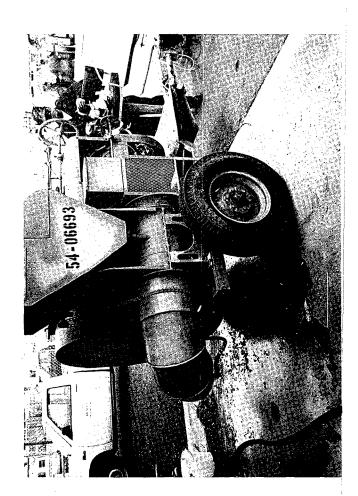
Building damage on the island of St Croix, VI, following Hurricane Hugo





no-fogger in a damaged t Croix,Vi. Vector Control Team 2 useing the warehouse on the island of





Buffalo-turbine sprayer being prepared for use in the Charleston area following Hurricane Hugo

### APPENDIX III-SELECTED MESSAGE TRAFFIC AND CORRESPONDENCE

ADMINISTRATIVE MESSAGE

IMMEDIATE

O 202100Z SEP 89 ZYB PSN 362428N25

FM NAVENVIRHLTHCEN NORFOLK VA

TO BUMED WASHINGTON DC NAVDISVECTECOLCONCEN JACKSONVILLE FL

INFO CHO WASHINGTON DC

CINCLANTELT NORFOLK VA NAVSTA ROOSEVELT ROADS RQ

COMNAVACTSCARIB ROOSEVELT ROADS RQ NAVHOSP ROOSEVELT ROADS RO

UNCLAS //NO6440//

BUTLER OF 20 SEP 89

SUBJ: PREVENTIVE MEDICINE ASSETS IN SUPPORT OF HURRICANE HUGO

A. PHONCON NAVENVIRHLTHCEN CDR GREEDAN/BUMED LCDR HAGEN OF AM 20 SEP

89

B. PHONCON NAVENVIRHLTHCEN LCDR HELMKAMP/NAVENPVNTMEDU TWO CAPT

PHONCON NAVENVIRHLTHCEN CAPT BOLTON/NAVOISVECTECOLCONCEN

JACKSONVILLE CDR ZIMMERMAN OF 20 SEP 89

D. PHONCON NAVENVIRHLTHCEN CDR GREEDAN/BUMED LCDR HAGEN OF PM 20 SEP

89

1. BASED ON DISCUSSIONS DURING REF A, REFS B AND C CONFIRM TWO PREVENTIVE MEDICINE MOBILE MEDICAL AUGMENTATION READINESS TEAMS (NAVENPVNIMEDU TWO NORFOLK VA AND NAVDISVECTECOLCONCEN JACKSONVILLE) ARE IN AN INCREASED STATE OF READINESS. FOLLOWING DISCIPLINES ARE

REPRESENTED:

EPIDEMIOLOGY/PREVENTIVE MEDICINE ENVIRONMENTAL HEALTH MEDICAL ENTOMOLOGY

DLVR: NAVENPYNTMEDU TWO NORFOLK VA(1) . . . ACT -DLVR: NAVENVIRHLTHCEN NORFOLK VA(5) . . . QRIG

1 OF

AV , MJORROM OKRM / MATA3058 263/20:57Z

362428/263 CSN: RXWW00570

263/20:58Z

NAVENPVNIMEDU TWO NORFOLK VA

202100Z SEP 89 -NAVENVIRHLTHCE

RTD: 093-000/COPIES: 0007

### III-SELECTED MESSAGE TRAFFIC AND CORRESPONDENCE

INDUSTRIAL HYGIENE MICROBIOLOGY

2. IN RESPONSE TO REF D THE FOLLOWING INDIVIDUAL WILL ASSIST CINCLANTFLT PREVENTIVE MEDICINE ASSESSMENT EFFORTS: LCDR H. R. STEVENSON, MSC, USN, MEDICAL ENTOMOLOGIST, 264-82-3612, SECRET, NAC DATED 23 JBN 79 BY DISNACC.

3. POCS ARE LCDR J. C. HELMKAMP, MSC, USN, DEPUTY DIRECTOR FOR FIELD OPERATIONS AND HMC R. BRENTS, USN ASST MMART COORDINATOR, AUTOVON: 564-4657, COMMERCIAL: (804) 444-4657.

вΤ

362428/263 2 OF 2 MATA3059 263/20:572 CSN:RXWW00570 202100Z SEP 89 NAVENVIRHLTHCE

Action Code Oi III-SELECTED MESSAGE TRAFFIC AND CORRESPONDENCE , , , , +

ADMINISTRATIVE MESSAGE

IMMEDIATE

n 2022357 SEP 89 ZYB PSN 360840N21

FM NAVHOSP ROOSEVELT ROADS RQ

TO NAVENVIRHLTHCEN NORFOLK VA

INFO NAVDISVECTECOLCONCEN JACKSONVILLE FL NAVENPUNTMEDU TWO NORFOLK VA

UNCLAS //NO5010//

SUBJ: REQUEST FOR SUPPORT/ASSESSMENT

A. NAVMED P-5010

1. PER REFERENCE A, REQUEST ASSISTANCE IN EVALUATING SITUATION POST

HURRICANE STRIKE FOR ALL NAVAL ACTIVITIES INCLUDING PUERTO RICO,

VIEQUES, CULEBRA. SPECIAL EMPHASIS ON VECTOR CONTROL WITH REGARDS TO

AEDES AEGYPTI AND DENGUE FEVER PREVENTION.

2. ANTICIPATE LARGE SCALE INCREASE IN MOSQUITO POPULATION

APPROXIMATELY 7-10 DAYS. NUMEROUS ARTIFICIAL CONTAINERS ON STATION

RTD:000-000/COPIES:000

202235Z SEP 89 NAVHOSP ROOSEV

AND IN LOCAL SURROUNDING AREAS. RESOURCES AVAILABLE ARE SEVERELY LIMITED. 3. ALSO ANTICIPATE INCREASE IN RODENT POPULATION. AVAILABLE CONTROL METHODS LIMITED TO TRAPPING.

REQUEST ON SITE SUPPORT.

BT

ADVANCE COPY FOR ACTU

DLVR: NAVENPVNTMEDU TWO NORFOLK VA(1) ... INFO DLVR: NAVENVIRHLTHCEN NORFOLK VA(5) . . . ACT-

MEHC NORFOLK, VA

1 OF 1 91 MAGA 25 9 6 28 263/18:317

-360840/263 CSN: DSX 00072

ADMINISTRATIVE MESSAGE

PRIORITY

P 282153Z SEP 89 ZYB PSN 453987N36

FM CINCLANTFLT NORFOLK VA

TO CNO WASHINGTON DC

INFO BUMED WASHINGTON DC

NAVMEDCOM MIDLANTREG NORFOLK VA

NAVENVIRHLTHCEN NORFOLK VA

NAVHOSP ROOSEVELT ROADS RO

NAVDISVECTECOLCONCEN JACKSONVILLE FL

UNCLAS //N06440//

SUBJ: REQUEST FOR PREVENTIVE MEDICINE SUPPORT NAVSTA ROOSEVELT ROADS PR

A. COMNAVACTSCARIB ROOSEVELT ROADS RQ 251230Z SEP 89 NOTAL

1. REF A PROVIDED REPORT OF PREVENTIVE MEDICINE ASSESSMENT AT NAVSTA ROOSEVELT ROADS IN AFTERMATH HURRICANE HUGO AND CONTAINED

REQUEST FOR VECTOR CONTROL ASSISTANCE TO HELP CONTROL SALT MARSH MOSQUITO AND ROOF RAT POPULATIONS.

2. REQUEST IMMEDIATE ACTIVATION OF MODIFIED PREVENTIVE MEDICINE MMART TEAM; ENTOMOLOGISTS AND TECHNICIANS WITH SUPPLIES AND EQUIPMENT TO PERFORM VECTOR CONTROL AT NAVSTA ROOSEVELT ROADS AND U.S. NAVAL

ACTIVIES AT VIEQUES IF REQUIRED. INFORMAL LIAISON BYWN THIS HOTRS. NEHC, EPMU-2, DVECC AND THE ON-SITE ASSESSMENT TEAM HAS BEEN ACCOMPLISHED. ESTIMATED REQUIREMENTS ARE:

TWO (02) ENTOMOLOGISTS TWO (02) PREVENTIVE MEDICINE TECHNICIANS APPROX. 21 CU FT/400 POUNDS EQUIPMENT AND SUPPLIES. LIFT WILL INCLUDE SOME INSECTICIDES

3. POC CAPT J. E. MCCARTY, MSC, USN, CODE NO2MI, AV 564-6160/COMM (804) 444-6160.

вT

DLVR: NAVENPVNTMEDU TWO NORFOLK VA(1) . . . INFO DLVP: NAVENVIRHLTHCEN NORFOLK VA(5) ... INFO

1 OF

453987/271 CSN: AUIA03956

AV Jacie Gled DHBM MATA3821 271/23:24Z 62 18 59 JES271/23:247

COMNAVACTSCARIB ROOSEVELT ROADS RO

NAVSTA ROOSEVELT ROADS RQ

NAVENDVNIMEDU TWO NORFOLK VA

282153Z SEP 89 CINCLANTELT NO

RTD:000-000/COPIES:0006

222

**IMMEDIATE** 

0 2921007 SEP 89 PSN 463891N31

FM BUMED WASHINGTON DC

TO NAVENVIRHLTHCEN NORFOLK VA

INFO CHO WASHINGTON DC

COMMAYFORCARIB
NAVDISVECTFCOLCONCEN JACKSONVILLE FL

//OPP400//ZAJONU

SUBJ: MMART ACTIVATION

A. PHONCON CNO (OP-932C) CDR HANRAHAN/BUMED (MED-27) LCDR HAGEN

B. PHONCON BUMED (MED-27) LCDR HAGEN/ NAVENVIRHLTHCEN MR. DICK

JOHN OF 28 SEP 89

oF 28 SEP 89 ,

1. THIS CONFIRMS THE TASKING OF REFS A AND A.

DIRLAUTH ALCON. ADVISE ORIGINATOR OF ALL ACTIONS TAKEN/INFO

ADDRESS ON ALL MSG TRAFFIC.

3. LOCAL FUNDING REQUIRED. MAINTAIN RECORDS OF ALL EXPENSES.

4. ADDITIONAL INFO PROVIDED AS AVAILABLE/NEEDED. ADVISE ORIG OF PROBLEMS.

5. YOUR RESPONSIVENESS APPRECIATED.

6. POC'S THIS ISSUE ARE LCDR C.W. HAGEN, MSC AND LCDR D.A. BALDINI, MSC, AV. 294-1060, COM. (202) 653-1060. AFTER HOURS THEY CAN BE REACHED THROUGH OOD AT AV. 294-1327, COM. (202) 653-1327.

вΤ

DLVR:NAVENPYNTMEDU TWO NORFOLK VA(1)...INFO DLVR:NAVENVIRHLTHCEN NORFOLK VA(5)...ACT

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CINCLANTELT NORFOLK VA

NAVENDVNTMEDU TWO NORFOLK VA

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2921002 SEP 89

BUMED WASHINGT



DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON. DC 20350-2000

6440 932D1-176-89

932D1-176-89 2 Oct 89

MEMORANDUM FOR THE DIRECTOR, READINESS DIVISION (BUMED 27)

042)

Subj: PREVENTIVE MEDICINE TEAM SUPPORT FOR ST CROIX

Ref:

(a) PHONECON between DOMS (CDR Butler) and OP-932 (CDR Hanrahan) on 28 September 1989
(b) PHONECON between OP-932 (CDR Hanrahan) and BUMED 27

(b) PHONECON between OP-932 (CDR Hanrahan) and BUMED 27 (LCDR Hagen) on 28 September 1989

1. As requested in reference (a), and discussed in reference (b), please provide four foggers and a team of five preventive medicine personnel to support FEMA operations in St. Croix. This request is per DOMS tasking #28-2 and FEMA tasking #23. Direct liaison with all concerned is authorized; please keep this office informed.

2. OP-932 point of contact is CDR Hanrahan, telephone '697-1449.

M. E. HIRSCHFEZD

Director, Medical Plans, Policy and Operations Division

Copy to:

DOMS

NEHC DVCC Jacksonsville

ADMINISTRATIVE MESSAGE

PRICRITY

P 131515Z OCT 89 ZYB PSN 590580N27

FM NAVENVIRHLTHCEN NORFOLK VA

TO BUMED WASHINGTON DC

INFO CHO WASHINGTON DC

COMNAVACTSCARIB ROOSEVELT ROADS RQ

NAVDISVECTECOLCONCEN JACKSONVILLE FL

UNCLAS //NO6440//

CSN:RXWWO0353

ST. CROIX, VI

A. RUNED WASHINGTON DC 2921007 SEP 89

R. NAVENVIRHLTHCEN NORFOLK VA 291610Z SEP 69

1. VECTOR CONTROL TEAM TWO (VCT-2) DEPLOYED TO ST. CROIX, VI TO PROVIDE HUMANITARIAN ASSISTANCE IAW REFS A AND B.

2. VCT-2 CONSISTED OF TWO ENTOMOLOGISTS AND THREE PREVENTIVE

MEDICINE TECHNICIANS PROVIDED BY NAVENPYNTHEDU TWO NORFOLK; VA AND NAVDISVECTFCOLCONCEN JACKSONVILLE, FL. DURING 1-10 OCT 89, VCT-2 ACCOMPLISHED THE FOLLOWING:

SUBJ: MOBILE MEDICAL AUGMENTATION READINESS TEAM (MMART) SUPPORT ICO

A. CONDUCTED CONTINUOUS SURVEYING AND SPRAYING OF MOSQUITO AND FILTH FLY POPULATIONS WHICH SIGNIFICANTLY REDUCED THE POTENTIAL RISK OF VECTOR-BORNE DISEASE TRANSMISSION. B. PROVIDED VECTOR CONTROL TRAINING TO LOCAL PUBLIC HEALTH

AND ARMY SUPPORT PERSONNEL. IDENTIFIED POTENTIAL DISEASE VECTOR BREEDING AREAS AND RECOMMENDED CORRECTIVE ACTION REQUIRING CONTINUING LOCAL AND LONG TERM EFFORTS.

SUPPORTED THE ST. CROIX PUBLIC HEALTH DEPARTMENT IN ESTABLISHING EFFECTIVE PEST CONTROL MANAGEMENT AND THE MEANS TO PROVIDE CONTINUED QUALITY PUBLIC HEALTH SERVICES.

3. VCT-2 COMPLETED ACTIVITIES 10 OCT AND RETURNED CONUS 11 OCT 89

DLVR: NAVENPVNTMEDU TWO NORFOLK VA(1) . . . INFO DLVR: NAVENVIRHLTHCEN NORFOLK VA(5) ... ORIG

RTD:000-000/COPIES:0006 1 OF 1/ MATX3685028600 SHEN 590580/286

1315157 OCT 89 NAVENVIRHLTHCE

CINCLANTELT NORFOLK VA NAVENDVNTMEDU TWO NORFOLK VA

יי. ארובה אכדוסט אברסמד זס רטענטשי

S. POCS ARE CAPT A. E. MATALDI, MSC, USU, MMART COORDINATOR, AUTOVOU: HHC RODNEY E. BRENTS, USN, ASSISTANT MHART COORDINATOR, AUTOVOU: S64-4657, COMMERCIAL: (804) 444-4657.

8

987/085065

ADMINISTRATIVE MESSAGE

PRIORITY

P 1316157 OCT 89 ZYB PSN 590552N26

FM NAVENVIRHLTHCEN NORFOLK VA

NAVSTA ROOSEVELT ROSDS RO

BORNE DISEASE TRANSMISSION.

TO BUMED WASHINGTON DC

INFO CHO WASHINGTON DC

CINCLANTELT NORFOLK VA COMNAVACTSCARIB ROOSEVELT ROADS RO

NAVDISVECTECOLCONCEN JACKSONVILLE FL

UNCLAS //NO6440//BUMED WASHINGTON FOR BUMED-27

SUBJ: MOBILE MEDICAL AUGMENTATION READINESS TERM (MMART) SUPPORT ICO

A. BUMED WASHINGTON DC 2921007 SEP 89

B. NAVENVIRHLTHCEN NORFOLK VA 291815Z SEP 69

1. VECTOR CONTROL TEAM ONE (VCT-1) DEPLOYED TO NAVAL STATION,

ROOSEVELT ROADS TO PROVIDE HUMANITARIAN ASSISTANCE IAW REFS A AND B.

2. VCT-1 CONSISTED OF TWO ENTOMOLOGISTS AND TWO PREVENTIVE MEDICINE TECHNICIANS PROVIDED BY NAVDISVECTECOLCONCEN JACKSONVILLE,

FL DURING 30 SEP - 11 OCT 89, VCT-1 ACCOMPLISHED THE FOLLOWING: A. CONDUCTED CONTINUOUS SURVEYING AND SPRAYING OF MOSQUITO POPULATIONS WHICH SIGNIFICANTLY REDUCED THE POTENTIAL RISK OF VECTOR-

6. ASSISTED NAVHOSP ROOSEVELT ROADS PREVENTIVE MEDICINE PERSONNEL IN CONDUCTING RODENT AND FILTH FLY SURVEYS. C. IDENTIFIED POTENTIAL DISEASE VECTOR BREEDING AREAS AND

RECOMMENDED CORRECTIVE ACTION REQUIRING CONTINUING LOCAL, LONG TERM EFFORTS. D. PROVIDED PEST CONTROL TRAINING TO NAVHOSP ROOSEVELT ROADS PREVENTIVE MEDICINE PERSONNEL.

3. VCT-1 COMPLETED ACTIVITIES 11 OCT AND RETURNED CONUS 12 OCT 89.

AFTER ACTION REPORT TO FOLLOW.

5. POCS ARE CAPT A. E. MATALDI, MSC, USN, MMART COORDINATOR, AND

DLVR: NAVENVIRHLTHCEN NORFOLK VA(5) ... ORIG

RTD:000-000/C0P1ES:0005

1316157 OCT 89

590552/286

CSN:RXWW00352

2 V/MATA3676 286/22:112 .. 286 /22:117

NAVENVIRHLINCE

HMC RODNEY E. BRENTS, USN, ASSISTANT MMART COORDINATOR, AUTOVON: 564-4657, COMMERCIAL: (804) 444-4657.

aТ

590552/286 CSN:RXWW00352 2 OF 2 MATA3679 286/22:11Z

131615Z OCT 89 NAVENVIRHLTHCE

ADMINISTRATIVE MESSAGE

RIORITY.

P 252000Z OCT 89 ZYB PSN 713734N25

FM COMFAIRCARIB ROOSEVELT ROADS RO

TO NAVSTA ROOSEVELT ROADS RQ

COMPHIBRON TWO COMSUPPRON EIGHT CG SECOND MAW

NMCB FIVE USS WHIDBEY ISLAND

USS BAINBRIDGE USS PENSACOLA

USS VALDEZ USS PRESERVER

USNS NEOSHO

NEESA PORT HUENEME CA NAVCOMMSTA ROOSEVELT ROADS RQ

NAVOCEANCOMFAC JACKSONVILLE FI HELSUPPRON TWO DET SIX HELSUPPRON EIGHT AMCC FOUR

NAVSPECWARUNIT FOUR

CDR2DARMDDIV FT HOOD TX

R 535TH ENG DET FT MONMOUTH NJ CDR 180TH TRANS BN FT HOOD TX

CDR 101ST ABN DIV AASLT FT CAMPBELL KY INFO USCINCLANT NORFOLK VA

COMNAVAIRLANT NORFOLK VA

MACG TWO EIGHT DET PAPA ROMEO

UNCLAS //N03000//

SUBJ: HURRICANE HUGO AFTER ACTION REPORT INPUTS

1 OF

1. AS DCO, ORIG IS REQUIRED TO SUBMIT A CONSOLIDATED HURRICANE HUGO

DLVR: COMDESRON TWO(5) . . . ACT DLVR: USS AUSTIN(1) . . . ACT

DLVR: COMPHIBRON TWO(1) . . . ACT

DLVR: NAVENVIRHLTHCEN NORFOLK VA(5) . . . INFO DLVR: AMCC FOUR(1) . . . ACT

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**KINHANS** #2TA03136299101;26Z

AFWTF ROOSEVELT ROADS RO

USS STEPHEN W GROVES

USS CLIFTON SPRAGUE

USS SPARTANBURG COUNTY

NAVCHAPGRU DET VICTOR

CDR JCSE MACDILL AFB FL

CDR 3-1TH ADA/57TH SIA BN

CINCLANTELT NORFOLK VA.

NAVENVIRHLTHCEN NORFOLK VA

COMCBLANT NORFOLK VA

NAVHOSP ROOSEVELT ROADS RO

NAVOCEANCOM DET ROOSEVELT ROADS RQ

CDR 169TH MAINT BN FT HOOD TX

CDR 235TH SIGCO FT MONMOUTH NJ

USS GUNSTON HALL

SECOND FORECONCO

HMH FOUR SIX ONE

HELSUPPRON SIX

COMDESRON TWO

CG II MEF

NMCB SEVEN

USS AUSTIN

USS DAHLGREN

252000Z OCT 89 COMFAIRCARIB R

145

DISASTER RELIEF AFTER ACTION REPORT ENCOMPASSING THE ENTIRE EFFORT IN PUERTO RICO AND THE U.S. VIRGIN ISLAND.

2. REQUEST ALL HURRICANE HUGO DISASTER RELIEF PARTICIPANTS SUBMIT AFTER ACTION REPORT INPUTS TO ORIGIN BY 31 OCT 89.

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713734/299 2 OF 2 MATA0313 299/01:26Z CSN:AUIA00266

THE THE RESERVE OF A NEW YEAR STORY OF SHE

252000Z OCT 8 COMFAIRCARIB

ADMINISTRATIVE MESSAGE

RIORITY

P 311945Z OCT 89 ZYB PSN 780912N27

FM NAVENVIRHLTHCEN NORFOLK VA

INFO BUMED WASHINGTON DC

NAVHOSP ROOSEVELT ROADS RQ

TO COMFAIRCARIB RUOSEVELT ROADS RQ

NAVDISVECTECOLCONCEN JACKSONVILLE FL

CINCLANTELT NORFOLK VA

NAVENEVNTMEDU TWO NORFOLK VA

HNCLAS //N03000//

SUBJ: HURRICANE HUGO AFTER ACTION REPORT

- A. COMFAIRCARIB ROOSEVELT ROADS RQ 252000Z OCT 89 NOTAL)
- 1. IRT REF A. FOLLOWING INFO SUBMITTED.
- PREVENTIVE MEDICINE DISASTER RELIEF ACTIONS COORDINATED BY NAVENVIRHLINCEN CONSISTED OF TWO VECTOR CONTROL TEAMS (VCTS), DESIGNATED VCT 1 AND VCT 2. THESE TEAMS DEPLOYED WITH APPROXIMATELY 7,742 LBS (506 CU FT) OF VECTOR CONTROL EQUIPMENT AND SUPPLIES.

VCT 1 CONSISTED OF TWO MEDICAL ENTOMOLOGISTS AND TWO PREVENTIVE MEDICINE TECHNICIANS FROM NAVDISVECTECOLCONCEN, JACKSONVILLE, FL. DEPLOYED TO NAVSTA, ROOSEVELT ROADS TO PROVIDE VECTOR CONTROL ASSISTANCE.

4. FROM 1 OCT THROUGH 11 OCT, VCT 1, IN COOPERATION WITH NAVSTA AND NAVHOSP, ROOSEVELT ROADS CONDUCTED EXTENSIVE SURVEYS FOR MOSQUITO BREEDING AREAS AND INITIATED NECESSARY INSECTICIDE SPRAY CONTROL MEASURES TO PROTECT NAVSTA RESIDENTS FROM MOSQUITOES. MOSQUITO POPULATIONS WERE REDUCED TO A MINIMUM AND A SIGNIFICANT DECREASE IN MOSQUITO ANNOYANCE WAS EXPERIENCED BY NAVSTA RESIDENTS. VCT 1 ALSO CONDUCTED PEST CONTROL TRAINING AND ASSISTED IN CONDUCTING RODENT AND FLY SURVEYS.

5. VCT 2 CONSISTED OF ONE MEDICAL ENTOMOLOGIST AND TWO PREVENTIVE MEDICINE TECHNICIANS FROM NAVENPVNTMEDU TWO AND ONE MEDICAL

DLVR:NAVENPVNTMEDU TWO NORFOLK VA(1)...INFO DLVR: NAVENVIRHLTHCEN NORFOLK VA(5) . . . ORIG -

> PODO:S31400/000-000:018 NEHC WORFOLK, VA えつきどうら

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311945Z OCT 89

NAVENVIRHLIHCE

ENTOHOLOGIST AND ONE PREVENTIVE MEDICINE TECHNICIAN FROM HAVDISVECTECOLCONCEN, JACKSONVILLE, FL DEPLOYED TO ST. CROIX, VI TO PROVIDE HUMANITARIAN ASSISTANCE.

6. FROM 30 SEP THROUGH 10 OCT, VCT 2 CONDUCTED MOSQUITO FOGGING, DENGUE MOSQUITO SURVEILLANCE AND FLY CONTROL IN URBAN AND RESIDENTIAL SETTINGS. FLY CONTROL WAS CONDUCTED AT ALL MAJOR GARBAGE AND REFUSE SITES. RECOMMENDATIONS FOR CONTROL OF THE DENGUE MOSQUITO WERE PROVIDED TO THE ST. CROIX COMMISSIONER OF HEALTH. SPRAY OPERATIONS WERE AUGMENTED BY LOCAL PUBLIC HEALTH PERSONNEL WHO WERE PROVIDED oJT.

7. POINT OF CONTACT IS CAPT A. E. MATALDI, MSC, USN, MMART COORDINATOR OR HMC(SW) R. E. BRENTS, USN, ASST MMART COORDINATOR AT COMM: (804) 444-7576 OR AV: 564-7576.

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CSN:RXYY00058

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